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SURGEON-GENERAL W. C. GORGAS, U. S ARMY

MEDICINE AS A PROFESSION

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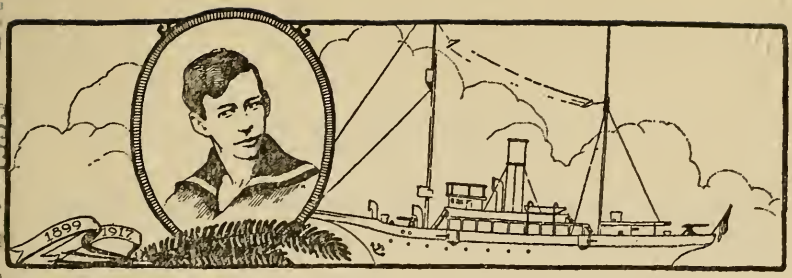

The final proofs of this book were completed on November 5th, 1917. Shortly after midnight on the morning of that day

Luther Oberlin Weaver

aged 18 years, 7 months, 24 days, a graduate of the Brooklyn Boys' High School,

who had assisted in collecting material for these pages, was sent at the time of the destruction of the U. S. patrol boat Alcedo by a German submarine, to his last sleep in an unmarked grave somewhere in the broad Atlantic far from the quiet churchyard where rest the ten generations of descendants of his German ancestors who took refuge from oppression in the American wilderness. By his enlistment at the outbreak of the war, he was compelled to decline a proferred college scholarship because, as he expressed it, "my obligations to my country must be put before my claims to her bounty." To his memory this book is dedicated and with this dedication the hope is expressed that whether in peaceful pursuits or dangers of war, the coming generations to whom are accorded the generous benefits of our public schools and colleges will give themselves as unselfishly to the service of humanity as did this young man and his twenty associates who sacrificed themselves in their efforts to make the world safer for democracy.

INTRODUCTION

Approximately 250,000 young people are graduated from our secondary schools every year, many of whom have ambitions to take up professional careers. With the increased cost of preparation for such careers, they are called upon to risk much upon a single decision. They are familiar with the status of the physician, the work of the teacher and the rewards of the clergyman. The pay of the teacher and the remuneration of the minister are matters of common knowledge. The expense of preparation for these lines of service is not so great because of the subsidized training facilities and the availability of scholarships. It is not so easy to answer the inquiries of those who are considering the choice of medicine as a profession.

To find a safe method of handling these inquirers, the writer who had for a number of years been the vocational adviser to the students of one of our large secondary schools undertook to enlist a number of former students who had established themselves in this profession to act as volunteer consultants. It was soon found that physicians, like men engaged in other callings, in comparing their achievements with the dreams of their youthful days, believed that every man's calling was to be preferred to their own and their pessimism seemed to chill unduly the ardor of the youthful aspirants. A collection of the professional records of young men of known abilities was then made and an effort was made to discover some sound principles of vocational guidance from these records.

The greater number of boys who grew up in a large city began their practice in the cities of their own section. It seemed desirable for purposes of comparison to have an equal number of records of those who had made places for themselves in smaller towns and cities and in other sections of the country.

I turned to my brother, who, after fifteen years of successful general practice and active identification with a progressive state medical association, of which for a time he had been president, at the time was sojourning in European medical centers for the purpose of study along some special lines in which he was interested. I wanted to know how the early life histories of physicians could most profitably be studied for the purposes which I had in mind. He replied that the way to study physicians is to isolate them and to study them the way that they themselves studied germs and microbes, that he had learned more about the hopes and aspirations and the shortcomings of American physicians in Europe than he did by associating with them at home, that these men who represented every section of our country talked more freely about themselves and their work in the dining rooms of European caravansaries than they did with the possible competitors whom they met in their medical societies at home.

He undertook to collect some material for me and soon became convinced that it was highly desirable that there should be accessible to the young student such a fair statement of the requirements for success as would deter the thoughtless and the poorly endowed from undertaking the preparation, and at the same time so alluring as to stimulate promising candidates to exert themselves to make the fullest preparation before enter-

ing upon practice. The outcome of the matter was that in spite of the exactions of a very busy practice to which he returned he undertook the preparation of this book.

After the manuscript had been prepared copies were submitted to inquiring young men and they were invited to personal consultations after reading it so that it might be determined what additions were needed to cover all possible questions which might arise in their minds.

Finally copies of the revised manuscript were submitted to a number of physicians to find out if, in their opinion, the conditions as they existed were properly reflected. In submitting the manuscript to them assurances were given that any criticisms which they had to make on the subject were not to be given out over their own names, as it was believed that in this way a freer expression of opinion could be secured.

Some of these critics seemed to think that special references should be made to courses of instruction which they themselves had found to be particularly helpful; others, that references to medical sects should have been omitted; others desired that mention should be made of the fact that appointments to special hospitals were particularly desirable and that young graduates should be cautioned against accepting appointments to others. Other helpful criticisms were carefully considered and as far as possible were incorporated in the text in making the final revisions.

Special acknowledgments are due to Mr. Robert I. Raiman, assistant principal of the Brooklyn Boys' High School, who read all of the final proofs.

E. W. WEAVER.

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CHAPTER I.

The History of Medicine.

According to the beliefs of superstitious ages, cruel demons were watching on every side for chances to do injury to man. Gradually tribes of men built up elaborate ceremonies and invented charms to drive off demons, and they arranged sacrifices and scheduled feasts in order to enlist the aid of helpful spirits. The medicine man was their leader in the performance of these ceremonies. If, from the traditions of the tribe and from his own experiences, he learned the demands of the demons well enough, and understood the voices of good spirits so that he could wisely select camping places, know the seasons for making victorious attacks upon enemies, found out how to arrange for success in the annual hunts, discovered what herbs to place in the food of the tribes upon the solemn occasion appointed to stay plagues, he succeeded in extending his influence over his subjects.

The Mosaic Law gave minute directions for wholesome living. These directions were enforced by the priests. The disciples of Æsculapius were required to record the stories of their cures upon the tablets which were placed on the walls of the shrines erected in honor of this early Greek physician.

Real progress in medicine, however, begins with Hippocrates, a Greek philosopher, who was born about 460 B.C. He was a careful observer and a conscientious

student and was much loved and highly honored by his countrymen He knew the effects of many drugs, understood the influences of unsanitary surroundings and was able to ascribe many diseases to unwholesome diet. Inasmuch as the early Greeks opposed the mutilation of human bodies, he knew little about anatomy. His code of ethics has given dignity to the medical profession. Hippocrates observed carefully the progress of disease; Aristotle, who followed him, through his study of the structure of animals made our first known contributions to anatomy, although it is possible that the Egyptian priests who were accustomed to embalm the bodies of the dead knew something of the structure of the human body.

Galen, from being the physical director to the gladiators of an Asiatic town, rose to the important position of physician to the great emperor, Marcus Aurelius. He knew something of anatomy. His recorded observations show that he knew something of hygiene. He recommended gymnastic exercises, the outdoor life and the use of the bath.

The physicians of the later Roman Empire were imitators who based their practice upon the writings of Hippocrates and Galen. For want of careful observation and continued investigation, medicine declined and this decline probably led to the first legal regulation of the practice of medicine. Under the laws of the empire, each town had its official physician, who examined and licensed practitioners. After the time of Constantine, hospitals and dispensaries were established. At later periods the monasteries became hospitals.

In the absence of any strong central government during the several hundred years of confusion, com-

Dr. William Harvey

monly spoken of as the dark ages, little progress was made in the study or the practice of medicine. The Arabs in Spain established the first apothecary shops and through their studies in alchemy accumulated a varied knowledge of remedies. Avicenna, one of their learned men, made a detailed and systematic compilation of the writings of the earlier Greek physicians and of their Arabian successors. During this period, the works of the old masters were taught in the University of Salerno. This university also issued diplomas in medicine to women. In the thirteenth century, we find that Frederick II of Naples decreed that no one should be allowed to practice the healing art until he had received his diploma and had served one year with an experienced doctor. The final examination was intended to test the knowledge of the applicant about the writings of Hippocrates, who had lived sixteen hundred years before, and of Galen, who had been dead over a thousand years. Each candidate, under oath, was required to promise to obey the laws of the state, live a pure life, give his service to the poor, and not to share in the profits of the apothecary.

Throughout Europe about the time of the discovery of America, the practice of medicine was almost exclusively done by the monks and the clergy of the lesser orders. Their religious scruples did not permit them to let blood. Surgery gradually fell to those who had diplomas. These learned men practiced almost exclusively among the wealthy, and in addition to the letting of blood for bodily distempers, bandaging their wounds, they shaved their heads. The surgeons of the rich were also their barbers and the barbers of the poor were their surgeons. The common people, also, had their wise

women who attended them in sickness, applied home-made ointments to their wounds, and supplied them with charms to ward off malign influences.

Strange compounds were prescribed. A remedy for consumption as set forth in an old volume was prepared by taking thriftgrasse, betony, peygrasse, fane, fennel, Christmaswort, and making them into a potion with clear ale. The breath of a donkey was supposed to drive out poison. A bleeding nose was to be cured by slipping a key down the patient's back. For stopping a cough the patient was advised to spit into the mouth of a frog. These foolish prescriptions were to be undertaken in certain phases of the moon.

When we consider the prevalence of such absurd notions and learn of the absence of sanitation in city and in country and read of the filth surrounding military camps, we wonder that the race ever survived. In truth, it was not an unusual thing for plagues to devastate entire countries. In the reign of William and Mary, England was swept by an epidemic of smallpox. The queen herself fell a victim to the scourge. For treatment, the patient was given a black powder supposed to have been made from the ashes of burnt toads. During this age bleeding was practiced for every kind of disorder, either by opening blood vessels or by applying blood-sucking leeches. It is said of one great French doctor, that in his hospital he used 100,000 leeches.

During these centuries of stupidity, valuable experiences were accumulated and the foundations were laid for discoveries which add to the usefulness of the physicians of the most remote hamlets of our day. These old-time doctors were taught to follow blindly the traditions which were handed down to them. Their knowl-

edge of the human body was too limited to permit them to reason intelligently about the causes of disease and the nature and effect of their remedies; they had no instruments; they were ignorant of the common principles of everyday science as we know them and they had never learned the methods of investigating new problems.

As a new age dawned a period of rapid progress followed in medicine, as in other departments of knowledge, introducing us to a long procession of men of great brilliance. Andreas Vesalius published an elaborate book on anatomy which stimulated the teaching of that subject in all the universities; Montanus of Padua lectured to his students at the bedsides of his patients, in which practice he was followed by Sylvius of Holland and the great Boerhaave of Leyden. They taught men how to study the progress of disease, how to learn the effects of disorders by examining the bodies of the dead, and how to apply new discoveries in physics and chemistry in the art of healing. William Harvey, an English physician, in 1628, published to the world his doctrine of the circulation of the blood. With the invention of the microscope the nature of the tissues of the body was better understood, and after the invention of the stethoscope by Laennec, a French physician, the diagnosis of diseases of the chest was established upon sound principles.

The invention of printing aided in the circulation of these new discoveries and in the wider distribution of the writings of the older investigators and practitioners. Medical schools multiplied. Better equipped men began to interpret anew the experiences of their predecessors and to carry on the search for new remedies. The uses of Peruvian bark were learned from the natives of South

America, about 1649, introducing a surer method for handling fevers. In 1798, Jenner announced to the world a method for controlling smallpox by vaccination. This list of beacon lights in medicine might be continued at great length but the details of the story of progress belong to the history of medicine and the biographies of its illustrious men.

With the recognition promptly given to those who have made new discoveries, there has come about that change in attitude which has made of every physician of our day a scientific investigator and has filled our clinics and laboratories with young men eager to add some new contributions to this important science and it has crowded our hospitals with practitioners whose chiefest desire is the perfection of some details of their art. The doctor of to-day is the very prince of professional men. The service which he renders may not be of a higher order than the services which are rendered by men in other professions but his spirit is one of greater and more devoted unselfishness.

Well were it for the candidate if, before making his final choice, he could take time to read the life histories of some great physicians. If he would succeed, he must remember that he is to enter the ranks of men, many of whom have mastered much of the accumulated inheritance of this age by long and patient study, and that when he enters upon the practice of his profession he must go before a public which for generations has been accustomed to be ministered to ungrudgingly by those who were moved chiefly by motives other than the tangible rewards of their profession.

Edward Jenner, M.D.

CHAPTER II.

The Place of the Physician in Society.

Some persons will seek to enter a calling so as to establish themselves in such a way that they may later engage in the larger and fuller relations of life, others take up a vocation in the expectation of making it their exclusive pursuit. Lawyers frequently change from their profession to take up mercantile pursuits, become leaders in corporations or to engage in public service. Men who have been trained for the ministry, too, are found in other walks of life. Ordinarily in every group of professional men about one third of all are over forty-five years of age. Of all the physicians enumerated by the census of 1910, nearly forty per cent. were over this age. This probably means that those who prepare for this profession continue in it and that it is more than likely that they do so because they find in their work the durable satisfactions of life.

These durable satisfactions for the average man include more than the financial rewards which come to him from his work and it may be well to consider what medical men have achieved outside of their daily occupations. They have been the pioneers in many scientific fields. Ever searching for new remedies, they have studied plants and become our first botanists. Otto Brunfels, a physician of Berne, may be called the father of the botanical sciences. Dr. Benjamin Barton of Philadelphia and Jacob Bigelow, a Boston practitioner,

achieved world-wide reputations as botanists before Americans attracted attention in literary fields. Theodore Schwann, the son of a German cobbler, became the founder of biology. John and William Hunter, who were in their days the leading physicians of England, were also the leading naturalists. Dr. Joseph Leidy of Philadelphia was a pioneer in zoölogy. Galvani, who was the first to call attention to animal electricity, was an Italian physician. Lothar Meyer of Germany and Dr. Berzelius of Sweden made important advances in chemistry, to which science physicians of all ages have made contributions.

From the very nature of their training we would expect doctors to be students and lovers of books and it is not surprising to find in their ranks the makers of books of popular interest as well as writers of books dealing with professional and scientific subjects. Sir Thomas Browne's *Religio Medici* has had appreciative readers for nearly three centuries. Dr. William Osler, of our day, writes that it was the reading of this book that determined him to become a physician. John Keats wrote verses while serving as an attendant at a London hospital. Dr. Oliver Wendell Holmes is more widely known for his contributions to literature than for his lectures to Harvard medical students. Thousands who have been entertained by the delightful stories of S. Weir Mitchell never knew that he was one of the leading physicians of his day, and every school boy has found healthful entertainment in the reading of *Rab and his Friends* by Dr. John Brown.

The advances in sanitation to which we owe the improved living conditions of our cities and the redemption of hitherto uninhabitable portions of the globe have been

made under the leadership of public-spirited medical men. The ventilation of factory buildings, the use of safety devices on dangerous machinery and the protection of workingmen in hazardous occupations has been brought about through the efforts of medical societies.

In self-forgetfulness, these men have performed heroic service on the field of battle and too often history has permitted the dashing performances of military leaders to obscure the work which was done by the medical staffs of the armies in caring for the campaigners and the tireless labors of the surgeons in the wake of retreating armies. Volumes have been written about the commanding officers of the armies in the wars between Francis I. and Charles V., while mention is hardly made of the improved methods of treating wounds by Ambroise Paré, the chief surgeon of the French armies. If history were properly written, Alphonse Laveran, who discovered the cause of malaria while with the French armies in Algeria, would be accorded as much prominence as that which is given to the military leaders of that expedition, and the labors of Walter Reed and his associates in dealing with typhus and yellow fever during the Spanish American War would far outshine the heroism of the leader in the charge on San Juan Hill.

Nor should it be wondered at that those whose work has to do with the mysteries of life and death should have in their ranks persons of great piety and deep religious convictions. Medicine has no nobler pages than those which record the stories of the lives of Dr. Grenfell, the medical missionary to the scattered people along the coast of Labrador, and Dr. David Livingstone, who first penetrated into the interior of darkest Africa.

Physicians have been influential in many ways, because of their intimate personal relations, through which they have won the confidences of large numbers of their fellows. As members of boards of trustees of colleges and universities and of educational committees they have been leaders in popular education. They have done more than any other class in establishing hospitals, in promoting prison reform and in improving the methods for caring for the dependent and defective classes.

The members of the profession have done their share in the fields of politics and government. Vesalius was the confidential adviser of the great emperor, Charles V, not only in matters relating to the health of the royal household but in the affairs of state; Thomas Linacre was not only a physician but a leading statesman of the time of Henry VIII; Corvisart, the physician to Napoleon, influenced him in many affairs; Benjamin Rush was one of the signers of the Declaration of Independence and was regarded as one of the foremost citizens of Philadelphia and highly honored because of the services which he rendered during a scourge of yellow fever; Josiah Bartlett, Lyman Hall, and Oliver Olcott were also signers of the Declaration and later served as governors of their respective states; and Matthew Thornton, another signer, rendered important services to the Continental armies during the Revolution and later was a member of congress.

During recent years the period of preparatory study has been lengthened and professional progress has been so rapid that only by the most careful management of his time and energy has the medical student and the practitioner been able to keep pace with progress and

more and more medicine has tended to become the exclusive pursuit of the members of the profession.

This tendency towards exclusiveness of interest seems to make it all the more desirable for the physician to have some avocation to which he can turn for a change or some hobby to carry his mind away from the burden of his daily routine. Many of the older physicians have turned to some secondary pursuits, in which not a few have distinguished themselves. Leopold Auenbrugger, the great Viennese of the eighteenth century, was author of a musical comedy; Claude Bernard, the noted French physiologist, was writer of plays; Titus Tobler, a Swiss physician of the nineteenth century, achieved fame as an orientalist. The practitioners of later years have found relief from the burdens of their work in athletics and sports, in collecting, and in country life occupations.

After this brief review, as an introduction to the next chapter, we may say that he who would succeed in this time-honored profession must have in him a promise of physical endurance and such a power of close intellectual application as will help him to the ready mastery of great accumulations of knowledge. He must be well trained to the wise use of his time and his energy and be prepared to deny himself all other ambitions and yet have some other interests sufficiently absorbing to take his mind from his day's work.

Reading References.

The interested student will do well to read the sketches of the men mentioned in these two chapters as they are given in any good encyclopædia or in biographical dictionaries and also a few of the more extended biographies which are listed in the appendix to this book.

CHAPTER III.

Desirable Native Abilities.

In answer to the question—Shall my son prepare for medicine?—a distinguished physician wrote to his friend: "There is on earth nothing greater or more beautiful than man, and the study of mankind is the most difficult and exalted subject of thought and action. Human development and ambition, human life and ills are all in the highest degree remarkable and touching. But you must bring with you keen eyes and acute ears; a great gift for observation; patience, and yet more patience for endless study; a clear critical mind; an iron will strengthened by opposition, but yet a warm and tender heart, comprehending and feeling every sorrow; a reverent spirit and austerity that is superior to sensuality, money or eminence; furthermore a decent appearance, polished demeanor, adroit fingers and health of body and soul. All of these you must possess if you would not become either an incompetent or an unhappy physician. You must stagger under the crushing burden of unending knowledge, and yet preserve the light-heartedness of the poet; you must know all the arts of the charlatan and yet remain an honest man; once for all, medicine must be your creed and your politics, your happiness and your misery. Therefore, advise no one to become a physician. If he still wishes to do so, warn him against it often and earnestly; but if he persists in spite of all,

give him your blessing, if he is worth it, for he will need it."

This advice is equivalent to saying that no young man should think of entering this profession, and no other profession for that matter, unless he has a sure faith in his abilities to overcome all obstacles which he may find in his way. Surely there is no surer way by which a young man may fortify himself than by placing in order all objections which can be raised against a certain course of action, and by successively proving that none of them is unsurmountable. Unfortunately young men should enter upon their definite preparation for medicine about the age of twenty or before, at which time, the spirit of youth with its vacillations has not always been outgrown. It is not ever best for friends to be too real in the terrorism which they picture to the ambitious youth who comes to them for advice. It may be safe to say that the chances of success in a profession increase with the strength of the call which compels the candidate to enter upon that profession and it may also be said that for those who find their highest satisfaction in social service, medicine supplies a well-defined field of work.

Here is an extract from a letter written by a medical student in Paris in 1832: "The morning from seven to ten is occupied by a clinic at the hospital; there are several clinics; each of them has its advantages. I shall vary my attendance at the different hospitals, but at this moment we are following Piorry at the Salpetrieré, two or three miles from our lodgings. From Salpetrieré we hurry to La Pitie; we listen to a surgical lecture, reach home in time for breakfast and then to the school of medicine. Lectures, with a private course in anat-

omy, fill up the day till four; after which a private clinic introduces me to some very interesting cases. We dine at five and then again to lectures till eight.

This letter makes no mention of the time needed to write up notes and to digest lectures and to do reading. Such a routine requires the strong physical constitution of a well-matured individual. It calls for a very tenacious purpose to carry a student successfully through from four to eight of the best years of his life of the unrenumerative labor of his undergraduate days and it likewise requires equally stern qualities to resist the physically deteriorating and discouraging influences which come in the following years of watchful waiting for patients. Moreover since the physician receives his largest monetary returns from his practice after the ripened judgment of that period of life when most other men are ready to retire we must conclude that a robust constitution is a first essential from a candidate who expects to secure reasonably profitable returns from his investments of time and money in preparing for this profession.

The growing conviction that the profession makes high requirements, perhaps, accounts for a constantly increasing number of the matriculates of our medical schools who drop out before graduation. This also explains why in the ten years preceding 1914 the number of male students in these schools has decreased 40 per cent.; the number of male graduates, 37½ per cent.; the number of female students decreased 44 per cent.; the number of female graduates, 50 per cent.

The medical student must detach himself from his own circle in order to give his time to his studies and yet when he would begin his practice he accumulates his

patients by his ability to enter into the social life of his community; he must be trained in scientific and exact methods and yet be able to meet the frivolous somewhat on their own plane; he must be social and affable, and yet he is forbidden to bring into his social relations any echoes of his daily work; trained in the making a true estimate of men and women and yet blind to the frailties of humanity; professionally, firm in dealing with the truth as he sees it and socially ready to be all things to all men. All of which means that he should have had behind him a broad social experience, the lack of which is perhaps one of the heaviest handicaps to the young men from the working classes and the boy from the country with limited social opportunities. Residence during his medical course in a social settlement or in a Young Men's Christian Association home may be recommended as a means for supplying an extended social experience.

A large number of those who make up the army of 150,000 American medical men and most of the 3,500 recruits who leave the medical colleges every year to take the places of those who drop out of this army have great natural gifts and are filled with the true scientific spirit for investigation and for giving to the world the results of their studies which means a great annual flood of medical literature. Ignorance of tried and proven methods of saving from death in any of its varied forms is criminal; so that we must add that it requires great intellectual aptitudes to enable a practitioner to keep squared with himself, to say nothing of his reckoning with the public and his competitors. This means that the young man who would succeed in this profession should be able to accomplish the prescribed school course

in much better than the average pace; say finish the high-school course at sixteen and the college course by the time the age of twenty is reached. He should be ready and excellent in his freehand drawing, which means a gift for observation; dexterous in his manual training, which means a facility to adapt means to ends; commendable in his mathematics, which means skill in reasoning; excellent in languages, which signifies readiness in extracting information from his professional books later in his career; absorbed in his sciences, which gives promise of the ability to acquire the essential spirit of his profession.

The period of physical growth ends with many at twenty and the period of intellectual growth is with some more limited, and such may do well in the routine work of the shop. The business man can crowd a great deal of work into his day, much of which is of a routine character; but that community whose physician has fallen into the routine of beginning every consultation with a diagnosis and ending with a physic will be called upon to lay increased burdens upon those whose duty it is to pray for its living and its dead.

Let us look into the daily life of a physician to see just what it calls for in the way of powers of endurance. Just as he is entering upon a good night's rest his telephone bell calls him to a remote neighborhood, where in the midst of the surroundings of the poor, frantic parents are watching a suffering child. The pulse is feeble. The situation calls for a man with an observant eye which has been trained by long and patient scientific study, to the quick and confident decision which characterizes the man accustomed to all the thinking processes, and the resourcefulness which comes from a wide

experience, in order that an operation may be performed under unfavorable conditions without trained help, and courage to face the possibility of carrying the malignant diphtheria back to his own children. A brief rest and then his morning office hours with their procession of suffering humanity; the nervous woman who needs mental treatment more than medicine; the woman of careless habits and evil ways who should be treated to the rigors of the law, whose case he can handle because he has had the shrewdness of the detective to discover the causes of ailments which she would conceal from him; and then the man who would have the doctor falsely certify to physical disabilities, so as to permit him to escape, for a time, deserved punishment by being excused from obeying the edict of a court of law. He is prominent and influential, he beseeches and threatens. The case calls for a high degree of moral rectitude which disregards consequences.

In his afternoon round of visits, he finds at the bedside of a sufferer from a long-standing disease, a friend who represents to his patient that another physician has treated such cases much more successfully by entirely different methods; the consultation must be carried on with a forgiving spirit into which few other men could readily enter. The afternoon ends with a visit to a hospital for contagious diseases, in which one of his own patients has taken an unfavorable turn. At the end of the long day he must be able to concentrate his mind upon the long history of a stubborn case. He reviews his former judgments of the disturbing causes, recalls to his mind long lists of similar cases, examines into the diet of the patients, analyzes the reports of the nurses, and notes the effects of the prescribed treatment in order to deter-

mine what modifications in his methods of handling the case are desirable.

The day may not be without a call from a fellow practitioner for a consultation over a troublesome case, in the handling of which he is sure that his fellow has blundered, yet concerning which he dare not fully express himself without having his motives misconstrued and this calls for Christian forbearance. Then comes a brief rest and the evening office hours.

Less than in any other line of work requiring a long period of intellectual training will either race or color be a handicap to a physician. In those quarters of our cities inhabited by the descendants of the foreign born there is the same opportunity for those of any given class to win rewards which are relatively equal to those which are open to the native born among their own people. That only 10.8 per cent. of our physicians in this country are foreign born when 20.5 per cent. of the population are foreign born, and that only 2 per cent. of the physicians are colored when 13.6 per cent. of the population is colored is perhaps due to the fact that not so many of these classes can afford the outlay which is needed by those who would prepare for the practice of medicine.

In 1907 there were 28 registered negro physicians in Philadelphia and 14 in Pittsburgh and in 1912 there were 59 in the former and 28 in the latter city. A negro graduate of the Harvard Medical School who began his practice in Philadelphia in 1869 continued up to his death in 1912, and the first negro woman graduate who began to practice in 1878 is still in practice in that city.

Though he has a strong constitution to hold himself in readiness for emergencies in each of the twenty-four

hours of the day when others are clamoring to have the working day restricted to eight hours for six days of the week, and though he has physical courage to enter pest houses and lazarettos and the moral courage to refuse to countenance wrong, the intellectual grasp to possess all knowledge and an evergrowing mind, diplomacy and tact and Christian forbearance and social training which will make him welcome in all circles, the physician will not be happy in his work unless he will be proof against envy as he sees inferior men in business overburdened with the possession of those things which appeal to the taste of cultured people and which are denied to him and his, and without jealousy when he sees unworthy men win honors and enjoy the emoluments of high places while he must perforce live his solitary life with an unending succession of human frailties and infirmities.

It may be repeated that many of these essential qualities are developed by men and women sometime after the age when preparation for this profession should be planned. For those who fail to develop some of these essentials for success after making their preparation there is open that very large field of the business of providing the supplies which are needed in medical work and in which the training given by the medical school will stand in good stead; then there is that ever-growing field of medical research in which those who are not adapted for general practice may hope to succeed; and that almost untouched field of industrial betterment, for success in which there could be no better preparation than a medical course. Those who later develop a high degree of executive ability will find an attractive field

in public health movements and in the management of hospitals and asylums and in public charities.

In spite of the high requirements it seems that the percentage of failures in the profession is not high. Sir James Paget of London followed the history of a thousand medical students in Great Britain and Ireland. He concludes that 23 of these may be considered to have achieved distinguished success; 66, considerable success; 507, fair success; 24, limited success; 41 died before beginning to practice and 87 within twelve years after beginning their careers; 56 failed entirely and 96 abandoned the profession for other callings. A careful study of biographical dictionaries discovered a very few persons who were educated for medicine who took up other callings. A few were found who had entered journalism, one who took up playwriting; several who became officers in business corporations and a few who took up social work and several who entered the ministry. With the stricter requirements for admission to the medical colleges the percentage of failures will likely be lessened.

CHAPTER IV.

The Financial Requirements.

The prudent man who would embark upon a long voyage first takes an account of his resources and tries to estimate the cost of the trip. Young people for whom liberal provisions have been made by self-sacrificing parents and the tax-paying public during the period of their infancy, sometimes expect such subsidies to continue long after they have passed from infancy to manhood. It is true that our states and the citizens have given liberally towards the encouragement of professional education, but some expenses must be met by the student and he should at the outset have a fairly definite idea of such expenses and his prospects of meeting them as they become due.

Dr. Samuel Bard, who left the colonies before the Revolution in order to get his medical education at the University of Edinburgh, estimated upon his return that his outlay for travelling, living and schooling was nearly a thousand pounds. Although the purchasing value of money has changed since then, yet from four to five thousand dollars comes very near to being the cost of a medical education in this day.

Thirty-four medical colleges require two or more years of college work before admission and fifty require one full year, so our estimate may well be based upon six years of study after the completion of a high-school course or its equivalent.

We will consider a boy from a town remote from a medical college who would enter upon the study of medicine and his brother who will go into skilled trade. The mechanic is not generally accepted in a trade as an apprentice until he is sixteen and in some trades not until he is eighteen years old. By this time the medical student should be ready for college and by the time the mechanic has served his apprenticeship and be ready to earn wages averaging from $750 to $1,000 a year, the medical student will be within one year of graduation. During his apprenticeship the mechanic will possibly earn enough to pay for his own support; so for the purposes of comparison we must add to the expenses of a medical education the cost of living and we will assume that inasmuch as the average length of the term in the medical college is thirty-four weeks, that the medical student during his vacations will be able to earn enough to pay for his clothes and spending money.

In one fourth of the medical colleges of the country, the total fees are between $600 and $700. In another one third the charges are in excess of this amount, so that we will assume $750 as the total of fees for tuition. For laboratory expenses, text-books, reference books and society dues we must allow $250. Boarding even in mess halls and boarding clubs will likely be more rather than less than $800 for the four years. This brings the cost exclusive of travelling expenses to $1,800. In New York, Boston and Chicago, it is more likely that the cost will be $2,500 for male students and $3,000 for those female students who are not able to live in their own homes or with relatives. To this must be added the cost of the time at college before entering upon his medical studies. Young men can usually ex-

pect to secure free tuition or college scholarships in most of the states, so that the expenses at college will be from $500 to $1,000 for the two years. This will make a total expense of from $2,250 to $4,000 without making any allowance for sickness or failures in promotion.

One physician estimated his expenses as follows:

Tuition	$150
Laboratory expenses	10
Board and lodging	160
Text-books	60
Clothing and incidentals	130
Traveling expenses	40
Total	$550
For the four years	$2,200

This total does not include any allowance for the preliminary college expenses nor for loss in earnings while attending medical college, and it is based upon living expenses in a city in which expenses are comparatively low.

An out-of-town student who was graduated from one of the best New York medical colleges in 1914 reported that his entire expenses were as follows:

For the preparatory year	$800.00
His first year	755.28
His second year	819.83
For the third year	1,133.46
For the fourth year	1,300.00

A more economical student at the same school reported a total expense for the four years at medical college of $1,370 exclusive of living expenses. It has been generally concluded by recent medical graduates who have been interviewed that it is not desirable for the

student to attempt to earn anything towards his expenses during the time when the colleges are in session.

A careful study of a number of records has led to the conclusion that the cost of a medical education must be considered as, at the least, $3,000 more than the cost of preparing for a skilled trade. The cost for female students will be higher, because there are not many free scholarships available in colleges for women and because the income from vacation earnings will likely be less than for male students.

Some of the very comfortable reformers who believe in regulating all the affairs of men by legislation could find many good arguments for refusing admission to a medical school those who cannot prove at the outset that they have $3,000 in available cash resources, but such would also have excluded from the study of medicine, Leopold Augenbrugger, the son of a poor tavern keeper, who became the physician to the empress, Maria Theresa; Theodore Schwamm, the fourth of the thirteen children of a poor German cobbler, who is noted as the father of the cell doctrine; Johannes Muller, the son of another German shoemaker who became the foremost physician of Germany in his day; and James Simpson, the youngest of a poor Scotch family of seven who is the father of anesthetics. Perhaps one half of those at present attending medical schools are successfully pursuing their studies in spite of financial worries.

It has been the experience of many who borrowed from friends the greater part of the necessary $3,000 and took out life insurance policies for that amount to protect their creditors in case of their death, that by the age of thirty they were enabled to repay their loans with interest, and it may well be considered whether it would

not have been as well for them if they had worked and saved for a few years before entering upon medical school, thus bringing a larger maturity to their studies, incurring smaller obligations and being perhaps as far at the age of thirty as if their educational training had been continuous.

One ambitious young man who spent the vacations of his college course in selling subscription books secured a position as a district manager with his employers and from this employment he was able to make enough during his vacations while attending the medical college to provide for all his expenses. At the end of his college course he went back to his college and organized selling squads among the students and directed these squads during his vacations while taking his medical course.

Another young man graduating out of the same class went into the office of a manufacturer of medical supplies expecting to work a few years before going to medical college. His work was so satisfactory that he was soon started on the road as a salesman. He applied himself so energetically to his work that within three years he was able to save enough for his entire medical course. In addition to his earnings he secured an experience which gave him a most helpful outlook over the professional field.

A physician who has a lucrative practice as a specialist in nervous diseases, when interviewed, gave this story. As a country boy he drifted to the city to make his fortune. For want of anything else he accepted a place as a waiter in a restaurant, and later secured work in the dining-room of a large hotel. This experience recommended him for a better paying position as

an attendant at a sanitarium in which he was able to earn good wages and save considerable money. The physician in attendance being attracted by the way in which he handled the patients advised him to take up the study of medicine. By the time he was twenty-five he had saved enough money for his medical course and had advanced himself in his studies so as to be able to meet the requirements for admission to the medical school.

A young man, now thirty years old, who holds a position in a government laboratory with a $2,750 salary, explained that during college he had specialized in biology and after graduation accepted a position as teacher of the subject in a city high school, which he held three years, meanwhile doing some of the required medical college work so that he was able to graduate after two years of regular attendance.

A young colored man who supported himself by working as a waiter in a boarding house while he was taking a special college course in chemistry, worked as an assistant in a chemical laboratory for a few years after his graduation from college, saving about half of the money necessary for his medical course and attracting the favorable attention of an employer who volunteered to make him a loan to meet his additional financial needs.

A young Hebrew who graduated from one of our medical colleges with credit, in 1914, had landed with an older brother in this country at the age of sixteen with a fairly good elementary education. His eyesight was not good, he could not speak the language of a strange land, but he secured admission to a city high school on the strength of his school credentials, and not only maintained creditable standing while attending this school but supported himself by serving a news-

paper route mornings and evenings, working from four in the morning to ten in the evening. In addition to paying his share of the modest quarters which the two brothers occupied he paid for two suburban lots on the installment plan. When he was ready to enter the medical college he sold these two lots for $1,200 and with the assurance of support from his brother entered upon his medical course with no special worries about the sources of his income.

A young woman, who after graduating from high school decided to take up medicine, prepared herself as a stenographer and acquired an experience which recommended her for a position as stenographer to the dean of a medical college. While serving in this position she was able to take occasional lecture courses and after she entered the medical school as a regular student she made a considerable part of her expenses by selling typewritten copies of her lecture notes to other students.

It is usually not difficult for young men and women to obtain remunerative work as attendants at hospitals and sanitariums. This kind of work gives the prospective medical student a chance to test his fitness for the peculiar requirements of the profession and at the same time makes it possible for him to earn something more than he would earn in those occupations which are ordinarily open to those without any special training. In another chapter there is given a list of such institutions in different parts of the country to which application can be made.

CHAPTER V.

Financial Rewards.

The exceptional few, who are impelled to take up this profession because they are endowed with such a rare combination of native talents as to find that the routine of the physician makes to them a special appeal, will be sure to succed and to find the calling so remunerative and satisfying that it would have been a misfortune to them to have permitted themselves to be drawn to anything else; but the average man at the outset will want to know what he may expect in the way of monetary returns from his labors and for the time and money which he is called upon to expend in making his preparation.

No definite information in regard to the earnings of physicians is available. The *Medical World* estimates that in 1902 there were in the United States 100,000 physicians whose average income was $1,000 a year; 20,000 averaging $2,000; 8,000 making an average of $3,000; not over 2,000 reaching the $5,000 a year mark; only 1,500 averaging $10,000; 200 reaching $20,000; perhaps 100 specialists making $25,000 apiece; and not over 100 who could claim $30,000 or more.

This would mean average earnings of between $1,000 and $1,500, or stated in another way, an average expenditure for medical services for each man, woman and child of $2.20 per year, which is perhaps not far wrong.

The average salaries of the 374 full and part time

physicians employed by the city of New York in 1912 were $1,300. Some of these gave their entire time to the public service and a comparatively few remained in the service for any number of years; four of them after an average service of seventeen years had attained annual salaries of $2,550; seven, averaging fourteen years of service, had attained to averages of $3,000.

The Bureau of Standards of the same city, after a careful investigation in 1915, recommended the following schedules of pay for physicians in the municipal service: medical internes in hospitals and institutions with maintenance $240 for the first year and $360 for the second; assistant physicians in institutions with maintenance, from $900 with annual increases of $120 to $1,380; senior physicians from $2,520 with annual increases of $240 to $3,480; and for part-time services averaging not less than eighteen hours per week, $1,500 with annual increments of $120 to $2,100; medical superintendents and chief physicians, $2,780 to $4,680.

In 1914 the authorities of Harvard University compiled from answers to inquiries sent to graduates the following table of average total earnings in law and medicine:

Years Out of Professional School	Law. Average Earnings.	Medicine. Average Earnings.
1	$664	$623
2	1,110	909
3	1,645	1,301
4	2,150	1,681
5	2,668	2,005
6	3,118	2,410
7	3,909	2,935
8	4,426	3,227
9	5,321	3,636
10	5,325	3,789

This means that those who replied, at the end of their tenth year of graduation, had earned during that year: in law, an average of over $5,000, and in medicine, less than $4,000. From the small number of replies which had been received from the ten year men in law, one may be led to infer that perhaps neither the less successful lawyers nor those who had given up law for business answered the inquiries. These tables are more suggestive than informing, since in either case they represent returns only from fractions of the groups studied.

The average full-time pay of all the male teachers in the high schools of cities having over 250,000 of population was $1,839 in 1912. While it is true that many persons in the public-school service later take up medicine, comparatively few doctors leave their profession to enter teaching, although a change from medical practice to some departments of educational work is quite easy in most of the cities. This means that the practice of medicine brings more satisfying rewards than this other line of public service of which we have definite information regarding the monetary returns and that taking the country as a whole we would expect for the fairly well-established physician, in country districts and villages, net earnings of from $1,000 to $3,000; in the smaller cities, from $1,000 to $2,000; in the larger cities, from $1,500 to $4,000; with much larger returns for the unusually successful men.

Approaching this problem from another side, we note the age distribution of physicians and surgeons, as given in the census, indicates that the proportion of physicians over forty-five years of age is larger than the proportion of such persons in other professions. This means that

a large proportion of those who enter upon the practice of medicine remain in the profession, although from the very nature of the physician's position in society and his opportunity to become acquainted with men of affairs one would think that it would be as easy for him to make profitable business connections as it is for lawyers.

According to a very careful study made by the *Journal* of the American Medical Association, the 2,205 physicians whose death was noted in the columns of that periodical for 1914 had attained an average age of between sixty and sixty-one years and their average number of years of practice was nearly thirty-four. This means that they entered upon practice at about the age of twenty-six, and assuming $3,000 as the cost of their medical education, it would seem that if, during each year of their productive period, they had laid aside $200 the principal and the interest on their outlay would have been more than repaid. Taking this amount out of their earnings it is more than likely that the average net earnings of physicians as a class will for this productive period of thirty-four years still be double the net earnings of the man who spent about as much time in learning one of the skilled trades and whose productive period is very much shorter.

It will be claimed that the physician has many expenses. Unlike the lawyers most of the physicians have their offices in their own homes. Their travelling expenses are much smaller than those of the men engaged in the engineering professions. While it must be conceded that the law offers more large prizes than medicine it is doubtful whether any of the scientific professions offer more opportunities for securing unusual financial rewards.

CHAPTER VI.

Prospects.

Certain economists claim that before any man undertakes to invest time and money in securing his special training for any vocation he should make sure that the particular vocation is not overcrowded and that there is a public demand for the services of one more trained man or woman in the field which he is thinking of entering. On the other hand it must be noted that very few persons who prepare themselves for gainful occupations or incur expenses for engaging in producing marketable commodities have any assurance in advance of a demand for their services or a market for their products.

It is well enough however to try to find out what statistics have to say about the prospects for remunerative service in this profession. For the entire United States there were in 1890, 167 physicians and surgeons per each 100,000 of population; in 1900, 174; in 1910, 165. For the ten largest cities in the country taken together there were in 1906, 236; and in 1910, 210 male and female physicians per 100,000 of population. Compared with 100 or less for most of the European countries, and 142 registered physicians per 100,000 for London in 1911, there seem to be indications that the current notion that the field is oversupplied is well founded. This disparity in the number of physicians in different countries may be partially explained by the methods of the census takers of this country, who enroll

every person who reports himself as a physician, as such, without considering whether he is actually engaged in practice, or duly licensed and registered. More care has been observed in this respect in the last census.

In determining whether the number of physicians is greater than the actual needs of the country, several things must be taken into consideration. A careful observer with a large acquaintance among medical men is of the opinion that in this country 20 per cent. of those who graduate never practice medicine; some, because they entered upon their preparation without any appreciation of the real significance of medicine as a career; others, because they early discovered that medicine is not a get-rich-quick enterprise if practiced according to sound ethical standards, nor even an easy way of making a living. Some, even, if they take up other callings retain the title of doctor and are so classed. In determining the chances for success in a given locality, it must be considered that from 10 to 20 per cent. of the registered physicians have retired from practice or are among those who while not actively so engaged, minister to the wants of a few families or patients of many years of standing.

After making due allowance for all these factors, a full consideration of these statistics would seem to force us to the conclusion that on account of the activities of the too numerous medical colleges the number of graduates has been in excess of the normal demands; this is reflected in the decrease of the enrollment in the medical colleges in recent years although a part of the decrease must be attributed to the higher requirements for admission. This tendency is to be noticed in the following table:

	1880.	1890.	1900.	1910.	1915.
Number of students in attendance upon medical colleges per 100,000 of population...	23	24	33	23	14
Number of graduates per 100,000 of population	6	7	7	5	3

The apparent oversupply, as compared with other countries, has been due to the greater freedom which persons of all classes have in taking up this work, and the oversupply had led to such competition for business as to make of our people probably the best served nation in the world in this respect. We may conclude that for the ordinary normal demands of the well-organized and prosperous large city or the smaller city with its contiguous country population, a ratio of from 150 to 180 per 100,000 of population is not excessive.

From 1902 to 1912 the average death rate among physicians was 15.93 per 1,000; so that, according to these figures, approximately 2,500 new medical graduates are needed each year to take the places of those who drop out of the ranks on account of death. Considering also the growth of the population and the larger needs of the under-supplied communities as they become more prosperous and considering particularly the increased demand by the industries for the medical supervision of workers and the rapidly growing movement for organized public-health service we must conclude that the present output of 3,500 medical graduates every year is not excessive.

By personal interviews with many physicians in several of our large cities some very conflicting testimony on this point was collected. While the committees of medical societies agree generally that there is an over-

supply of doctors, a study of the progress of young graduates seemed to lead to different conclusions. The explanation seems to lie in the fact that in some of these cities the American elements of the population are not increasing while the number of American physicians is increasing. On the other hand, the rapid increase in some of the foreign elements of the population whose families generally prefer physicians of their own race who understand their own language, habits and customs has contributed to the prosperity of men of particular nationalities who have taken up this profession.

Turning aside from the statistics of the subject and casting away the offhand opinions of old physicians, who, in common with men in other walks of life, are sure that things with them and in their work are becoming worse every day, let us examine into some concrete cases, after the manner of physicians themselves who try to find general truths in particulars.

Twenty years ago the son of a mechanic consulted his teacher about the advisability of taking up medicine. He was referred to the physician of his family and to his teacher's own physician. Both of them advised against it. The young man was of average mental ability, but with a capacity for steadiness and patient plodding. In spite of the advice given him he entered a medical college with what would at this time be considered an inadequate preparation. The college which he entered is one of those which has since been compelled to close on account of unfavorable criticisms by an investigating committee.

The young man settled in a western city with a population of 200,000 and over 400 physicians; moreover, having no money to keep down expenses he opened a

shop in a poorer section of the city. To his former teacher on a recent visit, he deplored the fact that he had not permitted himself to be advised against the profession and gone into business. He was disappointed because of what he had not accomplished and allowed himself to be unhappy in his disappointment.

"Let us look at it in this way," said his visitor, as they sat in his comfortable study overlooking the city. "How does your success compare with the records of the other fourteen boys who were graduated from the village high school with you?"

He concluded his review of their several histories, with which he had been fairly well acquainted through his frequent visits to the old home, with the statement that he didn't think that his wife would trade him off for any one of them.

Within the last year the writer had a visit from one who had been a classmate with him in a country academy. He was a young man who had no means, had enjoyed limited social advantages but had inherited a strong physical constitution and the conviction that he, himself, must be the architect of any fortunes which he could ever hope to enjoy. He entered a medical college with the minimum preparation required by the times and was graduated from a course which later had to be extended upon the demand of the public authorities. He settled in a small eastern town which according to the conclusions of our statistical review was at the time overstocked with medical men. In the course of thirty years he had so gradually grown into a competence that he had not recognized his own financial success. He had lived in comparative comfort, was able to give his

children the best educational and social advantages and to make ample provisions for his own old age.

The change in the personnel of the medical profession in any locality is well illustrated by the record of a county of 19,000 population in one of the central states. Twenty years ago there were 28 physicians in active practice; today there are 27 active and 9 retired physicians in the county, while the population remains approximately the same. Only 6 of the physicians who were in practice twenty years ago are so engaged now. Nine of them retired; two moved away and eleven died. Seventy-six newcomers registered within the twenty years, and only 21 of these are now in practice in the county. The larger number of those who removed could not establish a sustaining practice; some of these were incompetent physicians who could not have succeeded anywhere, but the others established themselves in other localities. Those who had the patience to grow into a practice, or, in other words, to build into one, succeeded. The schools of medicine, regular, homeopathic, eclectic or osteopathic, are important factors in some localities, and are worthy of consideration as possible factors in determining success, in given locations.

The action of Congress in placing the army and navy on a war footing will call for such a large number of appointments to the medical service as to influence favorably the prospect of recent medical graduates.

One of the foremost surgeons in one of our large cities reports that his earnings in his first year were less than $500; the second year, $750; the third, $1,500; reaching in the seventh year to $4,000; upon which, when he announced to his associates that he proposed to take a short time to study and after that to devote

himself to special surgical work, he was advised against doing so by the unanimous voice of his professional friends and yet in less than five years thereafter he had passed annual earnings of $10,000.

Taking all things into consideration and comparing the prospects in this field with the prospects in other lines of effort in which men are dependent upon the patronage of their fellows for their support, we must conclude that the man who has faith in himself, a willingness and the energy to prepare himself by the mastery of the best which his time affords, need have little fear of acquiring the durable satisfactions of life in this calling, but he must do what other men do to win success: offer his clients a superior service and then educate them to an appreciation of that service.

The table given in the appendix, showing the number of physicians per 100,000 of population in the several states and cities, may be of value to young physicians as indicating what sections of the country are oversupplied and what parts are undersupplied.

THE ANATOMY LESSON, FROM A PAINTING BY REMBRANDT, ABOUT 1650

CHAPTER VII.

Systems of Medicine

Just as we have parties in politics and sects in religion, we have schools teaching different systems of medicine. One of the first questions to be determined in the selection of a medical college in which to prepare for the practice of this profession is the system of medicine upon which the candidate desires to base his medical education. The four principal systems or schools are the so-called regular or allopathic, the homeopathic, the eclectic and the osteopathic. It may be taken for granted that the teachers and practitioners of each of these several systems are honest and sincere in their belief that their own is the best.

In the conquest of every extensive field of human knowledge we find like diversities of views and methods. In the development of the flying machine, one experimenter succeeds with a monoplane; he declares that it is the only satisfactory machine; another achieves wonders with a biplane and another establishes an airline with a Zeppelin who would fear to trust himself to the smaller machines, which he regards as mere toys. Gradually men combine the best features of each of the several machines or use one or the other according to their needs. So it is in farming; one man speaks of the profits which he made with diversified crops and another believes that the greatest success comes to him who would specialize in fruit or grain or live stock. One manu-

facturer builds up an efficient working machine by using a time basis of paying wages; another, equally successful by compensating his men on the basis of piece work, declares that a uniform daily wage would demoralize his force and bankrupt him. Their ignorance of what lies outside of their own experience warps their judgment. A young man who would decide upon taking up some one system of medical practice or another must make due allowances for the prejudices of those whom he consults.

With the progress of medicine, these several schools have not been slow to appropriate to themselves the best of the others and while it is desirable for a young man, at the outset, to know in general the essential principles of each, yet he will not go far wrong if he assumes that the spirit with which he takes up a system of medicine and the oneness of purpose with which he pursues his preparation will mean more to him than the selection of a particular school.

The theory and philosophy and only the very general differences of the several systems can be enumerated.

The Regular School.

The art of healing had made much progress long before the science of medicine had developed. By experience, men learned that certain kinds of treatment and certain medicines were effective, and in the course of time medical men accumulated vast stores of knowledge which was carefully handed down from one generation to another and as science advanced the reasons for the effectiveness of their methods became known; but whether the new candidate for the profession studied in the schools or with the men whose offices they entered

as students, in his education he was chiefly concerned with equipping himself with the traditional knowledge of the profession, and in this way the so-called regular school was developed.

The impression must not go abroad that all other schools are irregular or unauthorized or unrecognized by law. In the eyes of the law any duly licensed physician is considered a regular physician.

The physician of the regular school is the empiric of his profession. He determines upon a treatment or prescribes a medicine in a particular case upon the clinical evidence which he has of the value of the special treatment or the particular medicine and the results which have been secured by others; so, if any particular course proves effective in given diseases, the fact is noted and taught, and thereafter others are justified in their own judgment, the opinion of their fellows and in the eyes of the law in using the same in similar cases. This is empirical prescribing and it may be said that no test is so good or so reliable as the test of experience.

The regular school has fostered the introduction of many therapeutic agents. As a result of the experiments in the laboratories a large number of refined, positive and valuable agents have been developed. We have the antitoxin for diphtheria, another antitoxin for tetanus and some forty serums, vaccines, bacterins, which experience may later approve or reject.

The regular physician naturally will lay great stress upon the physical diagnosis of disease because, in order that he may be able to assure himself that he is using the traditional treatment, he must be able to diagnose diseases and recognize the description of these diseases as they appear in his treatises; and if, perhaps, the

therapeutic or treatment side of the regular practitioner has not kept pace with his ability in physical diagnosis, the advancement even in these lines has been almost revolutionary in the past seventy years. Formerly the doses of medicine were crude and massive; today they are put up in the most palatable vehicles, in sweet syrups, elixirs, sugar-coated pills, tablets, and aseptic, hypodermic flasks. The dose is very much smaller and it is seldom that a maximum dose is given upon the old "kill or cure" dosage.

The practitioner of the old school makes his diagnosis of disease; selects his treatment according to his experience in similar cases; writes out prescriptions to be filled by the regular pharmacists wherever these are available, and considers the main object of his treatment the restoration of his patient to health and only secondarily the advancement of medical science.

As a judge allows his decisions in difficult cases to be governed by precedents long after social changes have made them obsolete, so the physician oftentimes is tempted to protect himself from criticism in possibly unfavorable results by taking refuge in the traditions of his profession and, moreover, it is generally easier to depend upon precedent in determining a course of action than it is to work out a complicated problem through the slow processes of reasoning.

The Homeopathic School.

Society protects itself against anarchy and sudden revolutions by its conservatism. The ranks of the ultra-conservatives are uncomfortable places for the reformers; therefore the pioneers of progress find it wise to set up independent organizations to promote their views. Such

independent organizations may die in the course of time or parallel the work of the older ones, displace them or force their views upon them. In medicine these new schools have been designated as "irregular." The strongest and most influential of these are the practitioners of the homeopathic system, which is generally spoken of as the "sugar pill" medicine.

This nickname originated from the fact that in very many instances the homeopathic physician saturated sugar pellets or disks with the medicine which he prescribed, merely as a matter of convenience. Today all physicians use pills and tablets, sugared throughout or sugar coated. Then again the small dose of medicine which the homeopathic physician prescribes has been held up to ridicule by the old school for years, yet today the most advanced men of all schools use small doses as compared with the drastic dosing of a half century ago.

Women are often heard to remark: "We have a homeopathic physician for the children because they take his medicine; it is not so strong; but for adults stronger medicine is better."

The fact that children do get sick, and that about two-thirds of all illness is during infancy and childhood, would be strong argument in favor of the homeopathic system. The parents do want palatable medicine for the children, and this has been the cause of the adoption of a homeopathic system in many homes for the children.

The children mature and as a rule they continue to favor the family physician of their childhood. Many families have adopted this practice for trivial cases and later finding it effective in serious cases they have been led to adopt it for the adult members as well as for the infants. This is often done without going into the

theory of the practice, or without knowing anything of homeopathy, except that the physicians give palatable medicines in small doses, and cure as promptly as the physicians of other systems. They realize that the danger of over-dosing is minimized.

The theory upon which a homeopathic physician reasons is this: Nature is reacting against some poison and the fever is an index to its efforts to fight, or throw off, the poison accumulated within the system as a result of the disease. The duty then is to prescribe such remedial agents as will assist nature in its own efforts.

They also regard pain as only a symptom or a warning of the presence of some disturbing factor; and instead of administering an opiate to make the patient unconscious of the pain, thereby paralyzing nature in its own efforts at self protection, homeopathy tries, if possible, to remove the cause or to aid nature in its efforts to do so. If it be a foreign body piercing the flesh it is removed mechanically. If it is some offending food within the stomach that causes the pain, the homeopathic physician instead of giving an opiate to paralyze the nervous system so that the patient may become unconscious of the disturbing element, calls for some remedial measure that will aid nature in eliminating the disturbing factor.

The homeopathic school tests all its medicines upon healthy human beings before using them upon the sick. Each prover takes the medicine and records the symptoms that develop in their order of development. All the records of the various provers are taken together and the symptoms experienced by all the provers are recorded as symptoms produced by the medicine.

Such tests are made of all new remedies before they are added to the armamentarium of the physician. In

this way all fads and fancies are eliminated. In no field or vocation are fads and fancies so ready to present themselves as in medicine. The cure-alls are ever with us.

In the United States about one out of every seven physicians practices homeopathy. This ratio varies in different communities. This school has about 20,000 physicians, and nearly all of these are in private practice, hospital and corporation work.

In the army, navy, marine-hospital and public health service the appointments are made after an examination by a board of surgeons already in the service. These examiners are "regular" physicians and the examination is one conforming to the practice of their own school. So here is a strong argument against the study of homeopathy by any young man who aspires to serve in the army or navy, or for that matter in any government service in which examination must be taken before a board composed of physicians of the regular school.

The Eclectic School.

The Eclectic School is a system of medicine which arose as a protest against the nauseating, heavy dosing with poisonous drugs of half a century ago. The first National Eclectic Medical Association, organized in 1848, proclaimed that "disease was an impairment of life" and not an entity to be removed by violent and pernicious drugs, but rather by a conservative and supportive treatment for assisting nature to restore health. The eclectic school has insisted upon giving a small, pleasant, palatable dose, with the object of assisting nature's effort to restore health, instead of giving the massive, poisonous doses composed of concoctions of a number of drugs that too often hindered nature.

Then again the eclectics do a great work in the investigation and in the preparation of medicinal agents. The fact that it is possible to obtain such wonderful results with small non-poisonous doses of medicines is in a great measure due to their careful methods of preparing them. Many medicines lose their therapeutic properties through careless handling in the crude state and through careless and indifferent methods in the preparation of the tinctures. It is to the credit of the newer schools that the utmost care is taken in the selection of the medicinal plants to be used in the manufacture of tinctures, and that all plant tinctures are made of fresh plants, thus retaining all the effective principles of the agent. While the eclectics do use remedies prepared mostly from the highly organized vegetable kingdom, yet they do not depend upon them solely. They believe that the curative value of medicines can only be positively demonstrated by actual clinical testing on the sick, and therefore it does not matter whether the medicines are derived from the vegetable or mineral kingdoms.

The eclectic school believes in prescribing remedies upon systemic or specific indications, not for any specific disease. Take, for an illustration, pneumonia. The physician may have several different cases of pneumonia to treat and he may prescribe different remedies in all cases. If the patients would all present similar symptoms and similar conditions, they would all receive similar remedies; but if different symptoms manifest themselves they would receive different remedies, regardless of the fact that all are pneumonia cases. The eclectics treat patients and not diseases. If a patient has "a flushed face, bright eyes, contracted pupils, increased heat in the head and a congested headache," no matter

what the disease with which these symptoms are associated, whether pneumonia, typhoid fever, la grippe, etc., the same remedy would be selected in each. This makes a safe and simple prescription.

This school does not look with favor upon the exploitation of all kinds of animal serums, which are lauded as "cure-alls" for various diseases, for the reason that prescribing upon the specific name of a disease is disappointing, and also that the purity of sera cannot at all times be vouched for.

In private practice the eclectic will find many good openings. He may choose a place where he would like to live, apply himself to his profession, and he will succeed. This is especially true in rural districts.

Osteopathy.

This system of treatment or adjustment of the body in the sick has sprung up within the last thirty years. It is based upon the theory that there is a mechanical cause for all ills and diseases. The cause of the disease is a slipping of some vertebræ or bones which impinge upon some spinal nerves, and as a result the nerve function is perverted, resulting in excess or diminution of the blood supply to some organs.

Abnormal pressure may even cause disease in a remote part of the body through the reflexes or the sympathetic nervous impulse. The osteopath contends that these twists or subluxations need not be large ones in order to cause physical disturbances. The spots of contact are very small, yet cause a great deal of disturbance of the nervous system aside from the local pain. One cannot overestimate the nervous impulse and its influence in the maintenance of metabolism in the human economy.

Every point of the body has nerve filaments which play their part in the whole network of telegraphic lines. The vasomotor nerves practically control the distribution of the blood supply and all voluntary actions, while the sympathetic system controls to a large extent the internal functions. Many physicians believe that a number of diseases, especially neuralgias, are due to pressure, or irritation of the nerve affected; but the method of manipulation of the osteopath for the relief of such pressure is distinctive of the osteopathic system.

Other schools believe with the osteopath that, after all, nature does all the curing, the only difference being in the means which are used to aid nature. Whatever is best in all treatment is that which will aid nature; sometimes, check; sometimes, stimulate, as the case requires. The patient does not care a snap for theory, but for results, and the osteopath has given very creditable results in practice.

There are about 8,000 practitioners in the United States, and most of them doing well. The school possibly has suffered somewhat by the low standard formerly set for entrance and the low standards or lack of standards of study, as a result of which a number of incompetent practitioners are credited to the school. Of late years the course of study and general requirement have been brought up to the standard of other medical colleges, and this has developed skilled modern practitioners who study bacteriology, hygiene, disinfectants, surgery, obstetrics, etc., in the same thorough way as the students of the regular colleges.

The cost of tuition and other expenses are about the same as in the preparation for regular practice.

The osteopathic practitioner is legalized in all the states, except Maine.

From a business point of view a young man or woman of strong personality can do well in osteopathy. The field is not overcrowded. People are generally feeling kindly towards the system because there has been so much irrational empirical dosing with syrups, elixirs and pills until "they are sick of it." The osteopath has been able to extract a larger fee for treatment than the general practitioner has been able to get in similar cases.

One might consider here the opposition that a young man may meet in practice. The regular medical profession does not look kindly upon the osteopath, and makes matters unpleasant for the isolated osteopath. This feeling is not so much that they do not recognize the osteopath as a legitimate practitioner, but is due more to the questionable, or, as they call it, "unethical" means used by many osteopaths in advertising. Whether it is right or wrong does not enter into the question, but medical men have a code of ethics which prohibits advertising and which establishes the relations of physicians towards each other. Where the osteopath respects the code of ethics of the physician, he, too, is respected and shown the same fellowship.

Unlicensed Practitioners.

There are other schools of medical and drugless healing whose promoters, for a sufficient fee, promise to equip any student in a few months with their newly discovered science; and there are those who under the guise of religion profess that by the mere expression of a belief in their peculiar system, the believer may perform miraculous cures. Reputable journals carry their

alluring advertisements and it is fortunate that the common sense of conservative people has been crystalized into laws which make it impossible for any one to become a licensed practitioner who has not taken the prescribed training as described in the next chapter. One contemplating the healing profession as a vocation should select one of the systems that is recognized and legally licensed, and after this decision is made, should select a college with a high standard of efficiency.

CHAPTER VIII.

The Medical Colleges and their Requirements for Admission.

In planning for a medical education, consideration must be given to the election of the subjects of study in the high school, the nature of the work which should be done in the one or more years of college work and the selection of the medical college. This subject has been carefully studied within the past few years by several committees composed of medical practitioners and teachers of medicine. Prospective students will do well to consider the reports of these investigating bodies, bearing in mind that in order to get the approval of committees on which are found as many conservatives as progressives, such reports usually give the summaries of compromises and not reflections of well-balanced ideals.

These minimum standards, however, have served the purpose of furnishing a basis for the classification of medical schools. The kind of training that any professional school can give will depend upon the character of the student body as well as upon the kind of equipment and the professional experience and standing of the teachers. Moreover, the graduate of a professional school finds that his initial rating in his profession is made for him by the students who have been graduated from the same school before him. It is good policy, therefore, to attend a school whose graduates are rated

high in the profession, and it is safe to assume that the higher the standard of admission for students, the better the grade of instruction in any professional school.

The best medical schools are rapidly adopting the standards of admission which are prescribed by the Committee on Education of the American Medical Association; and it is likely that before another four years have passed, most of the medical colleges will require at least two years of college work in addition to the four years of training in the high school.

The recommendations referred to require that a student shall have had a full four years' course of training in an accredited or approved high school or other institution of the same grade, or that he shall present certificates showing that he has passed examinations before a properly authorized examining board, in subjects required in such schools covering at least fourteen units of work, each unit including not less than thirty-six weeks' work of four, or five, forty-minute recitations per week.

The recommendations referred to prescribe that there shall be seven units which shall be required of all students and which may be elected from the following: Reading and Practice of English, 2; Algebra to quadratics, 1; Plane Geometry, 1; Elementary French or German, 2; American History or Civics, 1. Two units of Greek or of Latin may be offered in place of the units in modern languages.

Seven additional units may be selected from the following: Intermediate Algebra, ½; Solid Geometry, ½; Latin Grammar and Composition, 1; Cæsar, 1; Cicero, 1; Virgil, 1; Nepos, 1; Greek Grammar and Composition,

1; Homer, 1; Xenophon, 1; Intermediate German or French, 1; Elmentary Spanish or Elementary Scandinavian, 1; Greek and Roman History, 1; Medieval and Modern History, 1; English History, 1; Botany and Zoölogy, 1; or Biology, 1; Chemistry, 1; Physics, 1; Physiography, ½; Physiology, ½; (no credit shall be given for science courses which do not include laboratory work;) Agriculture, 1; Drawing, 1; Manual Training, 1; Music, 1; Domestic Science, 1.

It will be noted in the table given in the appendix that medical colleges are even now beginning to require one or more years of college work, and that the leading medical colleges are requiring four years of such work.

The preliminary college year should include for a period of thirty-two weeks 2 recitation or lecture periods and 2 laboratory periods in Physics; the same in Chemistry; 2 recitation periods and 2 laboratory periods or 3 recitation periods and 1 laboratory period in Biology; and 3 or 4 recitation periods per week in advanced French or German.

Work is to be accepted only if taken in a standard college and not as a postgraduate course in a high school. If given as a premedical year in a medical college, it must be up to the standards set by approved colleges. It is advised that a year in a college of dentistry or pharmacy shall not be considered as equivalent to a year's work in a standard college, and that no credit shall be given for a course in which a student's record for attendance for the full year is below 80 per cent., but that graduates of regular colleges who have not done the work in these prescribed subjects, may be permitted to have until the opening of the second year in the medical college for removing their conditions.

The standards of the American Medical Association prescribe that a medical college must have at least six professors, giving their entire time to medical work, and an executive officer who has sufficient authority to carry out fair ideals of medical education; that it has a standard of admission for students equivalent to those given in this chapter; that it offers a full four-years' course of instruction of thirty-two weeks each, and that it requires of the student at least thirty hours of work per week.

It is also prescribed that the printed course of study should be carefully followed and should include two years of laboratory work under the direction of experienced teachers who are graduates of reputable medical schools in properly and fully equipped laboratories in anatomy, histology, embryology, physiology, chemistry, bacteriology, pathology, pharmacology, therapeutics and clinical diagnosis; that there should be two years of clinical work in hospitals and dispensaries with courses in internal medicine, surgery, obstetrics, gynecology, laryngology, rhinology, ophthalmology, otology, dermatology, hygiene and medical jurisprudence.

It is well for those who are selecting a medical college to study carefully the catalogues of the colleges which they are considering to see whether the college is able to offer them the facilities which this committee considers essential.

A college should own and control a hospital in which the students may come into contact with patients under the supervision of their teachers, and such a hospital in colleges having a hundred students should have not less than two hundred patients a day; and there should be ample accommodations for treating children's diseases,

contagious diseases and nervous and mental disorders, and for handling maternity cases, and at least thirty autopsies a year, together with facilities for handling out-patients.

It is also recommended that an acceptable college should have a fully equipped library, in properly furnished quarters, with a librarian in charge, and have a working museum with models and specimens duly classified and labelled; that there should be an ample supply of dissecting material and an experimental laboratory with a supply of live animals and adequate facilities for housing these animals.

As one reads over these specifications and notes that mention is made of the importance of having in a medical school X-ray apparatus, stethoscopes, projectoscopes and supplies of anatomical charts and manikins, he is forced to the assumption that at the time of making this report there must have been institutions lacking in these essentials. This is not surprising when one considers that many medical colleges have been organized by practitioners who hoped that by teaching they could add somewhat to the incomes which they were getting as practitioners. One would expect to find in this report recommendations that a medical college should have a certain minimum number of heads of departments whose salaries are large enough to permit them to give all their time to teaching and investigation; and that for professional training in a field which has such an extensive literature as medicine, it should be accepted without mention that a school should not only have a complete library in charge of a trained librarian and that mention should be made of courses of special training in the use of these libraries.

For the guidance of the prospective student, the American Medical Association publishes annually classified lists of medical colleges in which these institutions are rated according to the standing of their faculty members, their teaching and administrative organizations and the extent and character of their equipment and facilities for practical work. These lists should be consulted in selecting a college.

Success in the acquisition of knowledge and in its organization in the minds of the students for practical work presupposes that the student knows something about the nature of the mind and of the thinking and learning processes, and although professional courses do not usually prescribe anything nor do professional schools generally recommend it, it will increase the practical value of what the attendant gets out of any courses if he first reads or studies, with some care, some of the accessible books bearing upon the laws of mental operations and the principles of the efficient life. A list of these books is given at the end of this chapter.

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CHAPTER IX.

A General Survey of the Field.

It has been shown that we have in the entire country about one physician to every six hundred and fifty of the population; in country districts, one to about every two thousand people. Many of these physicians are old and have practically retired; some are giving their time chiefly to business; others, again, are devoting their time to public service; and many are engaged in research work.

The same motives which lead persons of other trades and professions to crowd into cities, lead medical men to locate in the great centers of population. The physician must go where the people are. Moreover, there are opportunities in the cities which are not found in the country districts; there are chances for hospital and dispensary work; the better educational and social advantages; the privileges of meeting specialists in the professional organizations; better fees; and opportunities for part-time salaried work.

The practitioner in the rural communities, on the other hand, does not lose his identity, as too often does his brother in the crowded cities; he is generally one of the influential members of his community; he commands a more permanent clientele and has less competition. He becomes by force of necessity more self-reliant, and although his fees are smaller his percentage of collections is larger.

The first puzzling problem of the physician who would devote his time to private practice is the selection of a location. Those who follow other trades and professions may sometimes change their locations to advantage; but the fate of the physician depends in a great measure upon the prosperity of the community with which he first casts his lot, for it is rarely possible for him to make a change of location without risking considerable loss.

The student of this problem would suppose that the distribution of the three thousand or more annual graduates of our medical schools who expect to enter private practice would be regulated according to some well established principles. Inquiry was made to learn what instruction was given by the medical colleges to aid their students in this important matter of choosing a location. It seems that the colleges as a rule overlook this matter of giving instruction in regard to the best methods of marketing the capacities for service which their students developed through the long and expensive years of study. A careful reading of some three hundred answers to a thousand letters of inquiry seemed to indicate that the matter of selecting a location has heretofore been largely a matter of accident and chance and that the method of trial and error resulted in the aggregate in a very large amount of waste.

One man replied that the final choice between several localities which he had under consideration was determined by a study of the directories of practicing physicians in those places. In one city he noted that half of the names which appeared in the directory for 1900 were not in the list for 1910. He concluded that because an unusually large number of those who tried

practice in that city abandoned it for some reason or other, the place was to be avoided. Another replied that while debating with himself about the relative advantages of two places he consulted a banker friend who pointed out to him that the figures of the state banking department showed that the average per capita deposits in the saving banks by the people of one of the cities was much larger than in the other and that therefore it was safe to infer that the first city was more prosperous. Another reported that he was deterred from locating in a manufacturing city when a friend showed him a copy of the census bulletin which indicated that the average annual earnings of factory workers who formed a very large proportion of those gainfully employed, was relatively small. Another investigated a new industrial city which seemed to be undersupplied with physicians to turn away from it because a very large proportion of the inhabitants were foreigners from a country in which the laboring classes had never been educated to make any considerable outlays for medical services and because as a rule these people were clannish and suspicious of those who did not speak their own language. One man reported that by accident a copy of the atlas of the U. S. census had fallen into his hands and that in looking over a map showing the relative value of farm lands for the entire country the thought came to him that a moderate sized town in a good farming country in which a large proportion of the people were retired or living on their investments and in which those who were gainfully employed were engaged chiefly in commercial pursuits would be a good place in which to find a permanent location, he added, however, that "in such places collections are confined

almost entirely to the time of the annual payment of rents and the settlement days which follow the sale of crops."

Not a few sharpers seem to be lying in wait for those who are looking for a location. A favorite dodge of real estate promoters in boom towns is to advertise desirable openings for physicians when they mean that they have offices to rent to desirable tenants. There are also rumors that there have been physicians who built up records of crowded consultation rooms in order to sell to advantage their practice and office equipments.

Sooner or later the insistent students of the medical colleges will demand that the faculties undertake an investigation sufficiently extensive to enable them to work out the sound underlying principles with which to make the approach to this problem and that instruction in these matters will form a part of the regular work of the colleges.

It must also follow sooner or later that all medical schools will follow the example of other professional schools and the more progressive colleges and universities and open for their graduates appointment offices and bureaus of counsel and advice through which trained and experienced men will make available for the use of graduates well indexed and up-to-date information for their guidance so as to minimize the waste of time and energy and discouragement which is incident to the slack period between graduation and full employment as a partial compensation for the lengthening of the period of medical study and preparation, nor is it too much to expect that before long the medical societies will awaken to the fact that it will be to the interests of their mem-

bers to aid in a more rational distribution of the newly graduated doctors.

There are many persons who prefer the routine work of the salaried man in institutions. Appointments of this kind are generally to be had by the young medical graduate; but the fact that after a few years those who accept salaried appointments leave them to enter private practice, may be taken as evidence that the latter offers the more durable satisfactions. It is well, however, to look over the ever-widening field of salaried positions.

The Field.

I. In private practice, city or country.

II. In the service of the National Government:
- The army service.
- The naval service.
- The marine hospital and public health service.
- The pension department.
- The Indian service.
- The Philippine service.
- The Canal Zone and coast survey.
- The pure food division of the department of agriculture.

III. In state and municipal service:
- Public health department.
- In departments of food and drug inspection.
- In departments of vital statistics.
- In sanitary work.
- As milk inspectors and bacteriologists and chemists.
- As lecturers on health topics.
- In public hospital service.

In penal institutions.
In charitable institutions.
With the state militia.
As medical school inspectors.
As supervisors of physical training in schools.

IV. In county service:
As health officers.
Pension examining surgeons.
Physicians to the poor.
Coroners.

V. In service of corporations.

VI. In research work.

VII. In service of fraternal societies.

Some of these newer fields of work are rapidly being extended. Corporations which employ many men or are engaged in hazardous undertakings employ physicians and surgeons to administer to the injured as promptly as possible in order to minimize the sufferings of their employees; to keep down the cost of maintaining the sick and the disabled and to lessen their own liabilities for damages. The railroad and traction companies have surgeons at convenient points along their lines, and insurance companies have physicians in all communities in which they do business. Every large steamship has a physician on its staff of regular officers.

Fraternal societies employ physicians by the year to wait upon their members, who pay annual dues for this service whether they are sick or well. Large hotels have regular house physicians for their guests, and many of the wealthy families employ physicians by the year to travel with them wherever they go.

Private sanitariums employ large numbers of young medical graduates, and many experienced physicians

conduct health-building institutions as business enterprises. Organizations engaged in movements for promoting the public welfare employ medical men to present their several causes to the public, the field of medical journalism takes up the time of others, and lately enterprising publishers of daily papers have begun to employ physicians to conduct departments on personal efficiency.

CHAPTER X.

The Army Service.

The medical service of the army is divided into five corps: medical corps, the medical reserve corps, the dental corps, the hospital corps and the nurse corps.

The medical corps consists of a surgeon general, with the rank of a brigadier general, 14 colonels, 24 lieutenants with the rank, pay and allowances of officers of grades corresponding to those in the cavalry service. No person shall be appointed to this service until examined and approved by an army medical board.

The appointments are made to the junior grade, or grade of first lieutenant; and after three years of service as lieutenant, one becomes eligible for examination for promotion, to the grade of captain. All further promotion to higher grades is by seniority, although the applicant is subjected to examination to determine fitness for advancement.

A first lieutenant receives $2,000 per annum, or $166.66 monthly. At the end of three years he is promoted to a captaincy and receives $2,400 a year. In two years more he receives an increase of ten per cent., making $2,640 or $220 per month. After 10 years' service the pay would be $2,880 annually, or $240 per month.

The pay attached to the rank of major is $3,000 a year, which, with 10 per cent. added for each five years' service, becomes $3,600 after 10 years, $3,900 after 15

years and $4,000 after 20 years. The monthly pay of lieutenant-colonel, colonel, and brigadier-general is $375, $416.66 and $500 respectively. Officers, in addition to their pay proper, are furnished with a liberal allowance of quarters according to rank, either in kind, or, where no suitable government building is available, by commutation; fuel and light are also provided. When travelling on duty an officer receives mileage for the distance travelled, including the distance covered in joining his first station after appointment as first lieutenant; the amount allowed is usually sufficient to cover all expenses of journey. On change of assignment he is entitled to cost of transportation of professional books and papers and a reasonable amount of baggage. Mounted officers, including all officers of the medical corps, are provided with forage, stabling and transportation for horses owned and usually kept by them, not exceeding two for all ranks below that of brigadier. Horses and horse equipments are furnished by the government for all mounted officers below the grade of major. Groceries and other articles may be purchased from the post commissary at about wholesale prices. Instruments and appliances are liberally supplied for the use of medical officers. Well-selected professional libraries are supplied to each hospital, and standard modern publications on medical and surgical subjects are added from time to time; current issues of a number of representative medical journals are also furnished for their use. At each military post there is also a laboratory for those interested in such work; and medical officers are encouraged to carry on special lines of professional study which appeal to them.

The Army medical officers are given one month's

leave of absence at full pay each year; and if this privilege is not accepted each year, it is allowed to accumulate for four years, and the four months may be taken in a continuous leave. The medical officer may also have leave of absence by permission beyond this one month, upon half pay. All leaves of absence granted on account of sickness are with full pay.

Medical officers may be retired at the expiration of forty years' service, or at any time on account of disability incurred in the line of duty. The pay of retired officers is three fourths the amount of the full pay of their rank upon retiring. Officers have also the privilege of attending the Army Medical School, wherever practical.

This school is established especially for the training of the younger men in military surgery, including the transportation of the wounded, first-aid treatment, operative surgery, military sanitation, including instruction in the examination of air, water, food, clothing, the location and sanitation of camps, etc., military medicine and clinical and sanitary microscopy.

The officers are detailed from time to time to service at stations, near the principal medical centers of the United States, in order to give them opportunities to attend lectures, clinics, and visit hospitals, attend meetings of medical societies, etc., so that they may keep in touch with the most advanced ideas of the time.

Applicants for first appointment must be between the ages of 22 and 30 at the time of taking the examination, citizens of the United States, and graduates of reputable medical schools.

The candidates must have had hospital or some practical experience in the practice of medicine. Interne

service in some hospital for a year or for a year and a half is the best and most acceptable way to gain the experience. For admission to the army medical corps this is obligatory.

Besides the examination to test intellectual fitness for the service, the candidate must possess certain physical requirements.

The physical examination must be thorough. Candidates who fall below 64 inches in height will be rejected. Each candidate is also required to certify that he labors under no physical infirmity or disability which would interfere with the efficient discharge of any duty which may be required. Errors of refraction, if vision is not below 20/100 in either eye, are not cause for rejection, provided they are not accompanied by ocular disease and are entirely corrected by appropriate glasses.

The appended table is given for convenience of reference, and it is expected that the candidate approximates to these measurements.

The army medical service offers to staff physicians

PHYSICAL PROPORTIONS FOR HEIGHT, WEIGHT AND CHEST MEASUREMENT.

Height, Inches.	Weight, Pounds.	Chest Measurement.	
		At Expiration, Inches.	Mobility, Inches.
64	128	32	2
65	130	32	2
66	132	32½	2
67	134	33	2
68	141	33¼	2½
69	148	33½	2½
70	155	34	2½
71	162	34¼	2½
72	169	34¾	3
73	176	35¼	3

and their families many social advantages. The social standings of the members of the staffs and their families, whether in camp or in field, are determined by seniority. It is true that associations are necessarily somewhat restricted, and that in some places a good deal of snobbery permeates the atmosphere.

Post duty becomes more or less of a routine character which is not always favorable to the development of the physician; and since the post physician has no competition, and his patients have little encouragement to appeal from his treatment, there is little to stimulate him to extend his equipment. In times of active warfare, and on the field of battle he has every chance to develop his resourcefulness.

The Army Medical Museum and Library in the Surgeon-General's office contains an interesting collection of anatomical specimens, and nearly 200,000 volumes of medical and surgical literature. This is the largest modern medical library in the world. The museum was primarily intended for the medical officers of the army. It was started after the Civil War and was designed to show the effects of gun-shot wounds and their treatment, in order to enable the surgeons of the army to be better prepared for such work in the future emergencies. Both the museum and the library are being continuously enriched by the contribution of specimens and books from physicians and surgeons in private practice.

To a young man or woman contemplating the study of medicine, who happens to be in Washington, a visit to this collection, which is open from 9 a. m. to 4 p. m. and is free, is profitable, as it shows the extent of the field of medicine and the progress which has been made in surgery.

CHAPTER XI.

The Naval Service.

The routine of the doctor attached to the naval training stations is not unlike the work at the army post but when he joins the staff of a battleship he gets a much greater variety of experiences, especially when his ship goes on a long cruise. The senior medical officer of a ship holds a very responsible position; as health officer, he becomes familiar with conditions in the seaboard towns of all climates; as surgeon, he is called upon to do a great variety of work; moreover, he is the eye specialist, the medical examiner, the food inspector; he is also the dentist, and he has to see that the quarantine regulations of all countries where his ship touches are observed.

As the health officer of the ship, the doctor makes daily inspections of cabins, wash rooms, barber shops, galleries, pantries and the general cleanliness of the men. Once a week a general inspection is made of the entire ship. He has supervision of the heating and ventilation of the seamen's quarters, and the water supplies.

When the ship casts anchor, he gets in touch with the health officers of the port, learns what diseases are prevalent, and notifies the commanding officer, so that he may determine what privileges may be accorded to the crew while the ship remains in port.

He inspects the meats and other foods which are taken on board ship, and plans the rations for the

sailors. He holds himself in readiness for consultations every morning, prescribes medicines and special diets for the sick, and directs special assignments for those who are not able to attend to their regular duties, or requests for them relief when necessary. Ordinary cases of sickness are handled as in private practice, but those who are suffering from serious sickness or chronic ailments may be transferred to hospital ships or to hospitals on land. This is done in times of peace as well as in war to preserve the fighting efficiency of the ship.

A modern war vessel is a veritable machine shop; accidents are likely to occur at any time, so that emergency service must always be available for treating broken bones, making amputations, treating injured eyes and performing every kind of operation which is required of a city hospital staff.

As medical examiner, he passes upon the physical fitness of men before they are accepted for service; gunners and signal men must have their vision frequently examined; divers must be examined before undertaking dangerous work, and the pugilists before entering boxing bouts.

These physicians must, therefore, be prepared for ministering to adult men for a great variety of ailments, but they have an advantage over the private practitioner, because, as a rule, they have modern appliances for their work; the hospital equipment is complete, sick quarters are well arranged, operating rooms are modern, testing appliances are adequate and usually the reference libraries are comprehensive.

The service demands complete and accurate records of all disabilities and fatalities, so that the physician receives such a training in the systematic and orderly

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transaction of the routine of his office as few other practitioners get.

After this brief review of the work which is assigned to the medical officer, it is not surprising to note the high standing which is accorded to him as an officer, and the recognition which is given to him socially, and that his personal accommodations on board ship are as attractive as those of the other officials.

It will also be readily inferred that for such positions of great responsibility men of the highest types are required. To get on smoothly with other officers, a man should have had the advantage of good social training; to win the esteem and hold the respect of representatives of all classes which go to make up the crew of a ship, the medical officer must be a man of integrity and courage; as the representative of his country among the educated men of other lands, he should have a broad general culture; and, moreover, he must be energetic enough to dispatch a great amount of work.

There are some disadvantages with which these men must contend. Their assignments are frequently changed, they are compelled to sever their home ties. Owing to the routine nature of much of their work, they are not likely to develop those rare traits which make of older family physicians the guides, counsellors and friends of the families of their patients.

The requirements for admission to the service are given somewhat in detail, because they comprehend what the best experts consider the physical basis of efficiency.

For appointment in the medical corps of the navy, the candidate must be a citizen of the United States, and between 21 and 30 years of age. He must be a

graduate of a reputable school of medicine. He must apply for permission to appear before the Board of Medical Examiners. The application must be in the handwriting of the applicant, and must be accompanied by the following: letters or certificates from two or more persons of repute, testifying from personal knowledge to his good habits and moral character; a certificate of citizenship; certificates of graduation from colleges and medical schools.

Form of Application.

.....191

Sir: I request permission to be examined for an appointment as assistant surgeon in the Medical Reserve Corps, with a view to subsequent examination and appointment in the Medical Corps of the United States Navy.

I was born at....., and was..... years of age on the.....day of..... 191.., and am a citizen of the United States, residing in....., county of....., in the State of....., and graduated from.....Medical School in 191..

I forward herewith certificates of moral character, habits and citizenship.

Very respectfully,

.....

Chief of the Bureau of Navigation,
Navy Department, Washington, D. C.
Via the Surgeon-General, U. S. Navy.

The physical qualifications of applicants for appointment as officers in the medical corps are decided upon by an examining board consisting of medical officers of

the navy. The physical examination of candidates will precede the mental and professional. No one found physically disqualified will be examined further. No material physical defects will be waived in any case for any reason.

A candidate must declare under oath that he labors under no mental or constitutional disease or weakness, nor under any other imperfection or disability which might interfere with the most efficient discharge of the duties of an officer in any climate.

Table of physical proportions for height, weight and chest measurement:

Height, Inches.	Weight, Pounds.	Chest (mean circumference), Inches
66	132	33–1/2
67	134	34
68	141	34–1/2
69	148	34–3/4
70	155	35–1/2
71	162	36
72	169	36–1/4
73	176	36–3/4

It is not necessary that the applicant should conform exactly to the figures in the foregoing table, which is given to show what is regarded as a fair standard of physical proportions. A variation not exceeding 15 pounds, not to fall below 132 pounds in weight or 1 inch in the mean chest measurement, below the standard given in the table, is admissible when the candidate for appointment is active, has firm muscles, and is evidently vigorous and healthy. A chest expansion of less than $2\frac{1}{2}$ inches is a sufficient cause for the rejection of the applicant.

Any one of the following conditions will be sufficient to cause rejection: Feeble constitution; poor physique; impaired general health; any disease or deformity, either congenital or acquired, which would impair efficiency, such as weak or deranged intellect, cutaneous diseases, parasites of the skin or its appendages, deformity of the skull, abnormal curvature of the spine, torticollis, inefficiency of joints or limbs, deformity of joints or bones either congenital or the result of disease or injury, epilepsy, or other convulsions, disease of the eye, defective vision, color-blindness, impaired hearing or disease of the ear, chronic nasal catarrh, ozena, polypi, great enlargement of the tonsils, impediment of speech, disease of heart or lungs, enlarged abdominal organs, evidence of sclerosis, tumors, hernia, large varicocele, sarocele, hydrocele, stricture, fistula, hemorrhoids, varicose veins, disease of the genito-urinary organs, deformed or diseased feet; evidences of intemperance or of the morbid use of drugs, loss of many teeth, or teeth generally unsound (teeth properly filled not to be considered unsound). Every applicant must have at least 20 sound teeth, and of these not less than 4 opposed incisors and 4 opposed molars.

Acuteness of vision must be as follows: For the medical corps, not less than 12/20 for each eye, unaided by glasses, and capable of correction by glasses to 20/20.

Upon entering the service, a medical officer is assigned to one of the naval hospitals until the following October, when the Naval Medical School, at Washington, opens. He is then transferred to this school for six months of study. One might wonder why this is necessary, when none but graduates from reliable medical colleges are accepted. No medical college can train physicians suffi-

ciently in the rules, regulations, discipline, customs, uniforms and other matters of detail of the service. The young officer receives pay while attending this Naval Medical College, after which he is assigned to sea duty for 3 years as an assistant surgeon, and after that he is promoted to the rank of passed assistant, which carries with it more salary and more responsibility.

The promotion to the grades of surgeon, medical inspector, and medical director is governed by seniority, as the vacancies in higher ranks occur.

A medical officer has the privilege of retiring after thirty years' service, receiving three fourths of the highest salary of the grade in which he served when retired.

PERSONNEL OF MEDICAL SERVICE OF U. S. NAVY.

	Pay.	Allowance for Quarters.
11 Surgeon-generals	$6,000	$1,152
17 Medical directors	5,000	1,008
14 Medical inspectors	4,500	864
81 Surgeons	3,300–4,000	720
158 Passed assistants	2,400–3,120	576
49 Assistant surgeons	2,000	432

Naval Hospitals are located as follows: Annapolis, Md.; Aucon, Panama; Canacao, P. I.; Chelsea, Mass.; Colon, Panama; Great Lakes, South Chicago; Guam, Miarian Island; Las Animas, Cal.; Mare Island, Cal.; Narragansett Bay, R. I.; Norfolk, Va.; Pearl Harbor, Hawaii; Pensacola, Fla.; Philadelphia; Port Royal, S. C.; Portsmouth, N. H.; Puget Sound, Wash.; San Juan, Porto Rico; Sitka, Alaska; U. S. S. Relief; U. S. S. Solace; Washington, D. C.; Yokohama, Japan.

The Hospital Ship.

The hospital ships today are nothing less than floating hospitals. The divisions are similar to the hospitals on land; medical wards for the sick, other departments for the surgical cases, and isolation wards for the infectious diseases. There are also special rooms for the eye, ear, nose and throat cases, the dispensary for the sick who are not confined to bed, the officers' sick quarters, the dental room, the pharmacy, X-ray room, chemical and bacteriological laboratories and operating rooms.

Each of the hospital ships has its commanding officer and crew for navigation, while the hospital is in charge of an executive medical officer who is responsible for the management of the hospital. The medical staff usually consists of six or more medical officers, a dentist and a pharmacist.

The executive surgeon is supreme in the medical service, and under his supervision some of the most perfect team work is developed. Every medical officer is assigned to a definite duty. He is required to make daily reports. Every evening, consultations are conducted to discuss the treatment of cases, the necessity of operation and the methods to be pursued.

The routine is methodical, and is conducive to the best professional development. The reports must be in detail, and any neglect of duty, or incompetency in service will show in the reports. There is possibly no field of medical service that will develop the resourcefulness of a young physician so satisfactorily as the service on a hospital ship. The ships accompany the war fleets, and the ill on the war vessels are transferred to the hospital ships.

CHAPTER XII.

The Indian Service.

The remnants of the Indian tribes scattered over the western states and territories are the special care of the federal government. The physicians who minister to their needs are salaried employees of the government. The field should be attractive to young men, more especially as it affords experience on sanitary supervision and in preventative measures as well as in medical treatment for diseases.

These men are under the supervision of the Department of the Interior. The staff comprises: a medical supervisor; 2 assistant supervisors; 6 eye specialists; 7 dentists; 108 physicians; 78 contract physicians; 3 traveling nurses; 68 regular nurses; 72 field matrons.

Entrants are selected by civil-service examination. Announcements of these examinations are made in the semi-annual circulars of information, which may be secured by writing to the Civil Service Commission at Washington.

The annual report of the commission states the number examined, the number passed, and the number appointed each year. From these reports it appears that a large percentage of those who pass the examination secure appointments.

The entrance salary for medical men for full-time service is from $900 to $1,100 with certain expense allowance. Promotions are made as vacancies occur.

The contract physician is usually a physician who is available in sparsely settled districts where there is not enough practice to require the full time of a physician. These men get about $480 to $500 per year from the government for this part time service.

These physicians are located on Indian reservations where schools are operated. These stations are the headquarters for the reservation officials, schools and hospitals. The Indians come to the hospitals for treatment and in many cases travel fifty or a hundred miles.

In former times the Indians depended upon their own medicine men. Before the government controlled the Indian tribes, the medicine men were few. As an old Indian chief expressed it: "When the medicine man examined a patient and promised a cure and the patient died, then we killed the medicine man, but today the government does not permit us to do this, and so we have numerous medicine men."

Today the medicine men are very much in evidence among some tribes, but not more so than "pow-wow" doctors among the ignorant whites and the negroes. One even hears of these charm doctors, magnetic healers, with their various mutterings and incantations, in many of the so-called educated white communities.

The Indian tribes differ as much in their tribal practices and customs and physiognomy, as do the Germans, Italians, Irish and English. Many interesting customs prevail, as for instance, the disposition of the dead. The Navajo Indians burn the house or tent in which the deceased lived, together with the body of the dead. The credit is given the old Mosaic Law for the establishment of the first sanitary code, yet there is found among the most uncivilized Indian tribes a practice of cremation

of the dead, and burning of the house and all the belongings of the dead—a sanitary measure against the spread of disease. Small-pox epidemics have in many instances nearly wiped out whole tribes, and while the Navajo Indians knew nothing of the bacterial cause of disease, they instituted this effective sanitary practice to prevent its spread.

The physicians of the Navajos Indian Service respect this traditional practice, and when any Indian is fatally sick in the government reservation hospital, he is moved out of the hospital to a tent or to his home before he dies. No Navajo would ever enter the hospital if to his knowledge any one had died in it.

Dr. N. F. Canaday, who was in the Indian Service among the Pueblo Indians, says: "The Pueblo Indian was slow to make new friends, but after he accepted the new friendship, he was very loyal. Some of the staunchest friends I ever had were Indians."

The following incident given by Dr. Clarence W. Mullikin, formerly of the Indian Medical Service, shows how they appreciate the white medicine men. "While stationed at Oraibi, Ariz., a Navajo Indian chief came in one day to consult me concerning the physical condition of his son, who was at that time quite sick. The chief told me that the young man was his eldest son, and he was very anxious that he should live to take his father's place as chief of his particular clan. He told me that he had hired several of the Navajo Indian medicine men to treat his boy, and each in his turn had failed to restore the boy's health; but for their service they had taken most of his horses, cattle and sheep; and now he was a poor man, and his son about to die. The sand painting, the Indian dance, drinking of sacred

potions and all of the superstitious methods of treatment known to the Navajo Indian medicine men had failed; as a last resort he had come to the white medicine man for help.

"In his own language he told how his boy was suddenly taken sick with a chill and vomiting, and had then developed a high fever which lasted several days. He breathed hard and fast, and coughed up a bloody sputum, and had much pain in his left side. After several days had passed the fever disappeared, but the boy continued to grow weaker and weaker and thinner and thinner, until now after six weeks of sickness he was so weak that he could not lift his arm, and had the appearance of a mass of bones with the skin alone covering them. His left side was bulging so much that it seemed as though it would burst. It was on a Saturday evening that the chief came to talk to me. I told him to go home and I would come the following morning to see what could be done for his sick boy.

"Early the next morning, after getting together the necessary drugs and surgical supplies which I thought I might need, and in company with a Mexican Indian trader, we began the trip to the chief's camp in a buggy with two strong horses to pull us. We were to go a distance of about fifty miles. About noon we reached the camp. Our patient was, indeed, a sad sight to behold. He had had pneumonia and now had a large collection of pus in his left side. His heart was very weak and beating at the rate of 150 beats per minute. I can see him now as he lay there on the warm desert sand—a mere heap of skin and bones, struggling for his breath, each gasp seemed to be his last. Death apparently was only a few hours distant.

"I explained to the chief that there was practically no hope for the boy and in order to help him at all, there would have to be some openings made in his side so that the pus could drain out. His heart was too weak for an anesthetic to be given to relieve pain. This was explained to the boy and he said he would be glad to have the opening made in his side and was willing to suffer the pain, even if it only helped him to die easier; and then, too, he wished so much to live, and if this was a chance for recovery, he wanted to take it. These openings were made in his side and most of the pus drained out. The side was irrigated with a solution consisting of a small amount of carbolic acid in boiled water, which I had brought with me. Tubes were placed in the openings to allow further drainage. The young man suffered much pain but stood it bravely. I stayed with him three hours and by the time I left he felt much relieved and breathed easier.

"Before leaving I gave the chief some medicine for his son and explained how the patient should be cared for. He was also advised to let me know if his son was still alive on the next Saturday; if so, I would return again. On the appointed day I received word that our patient was alive and better. The next day I returned to the chief's camp and found the boy much improved. I again left medicine for him and gave instructions as to how to care for him. Once after this second visit I heard that the boy continued to grow stronger.

"Several weeks later I left my station at Oraibi and moved to the hospital at Tuba, Arizona, which was more than one hundred miles from the chief's camp.

"One day while watching a Hopi Indian dance near Tuba, I overheard a Navajo Indian talking to a bunch

of Hopi Indians, telling them how his son had been very sick and that the Navajo Indian medicine men had treated him and failed, but had taken most all of his horses, cattle and sheep for their services, and how he finally appealed for help to the white medicine man by whom his boy was cured; I became interested and thought I would walk around to a place where I could get a view of the speaker's face.

"At first glance I recognized him. I had no more than gotten my first glance of the chief's face, when he too looked in my direction and at once knew me. He came forward with right arm extended and we clasped hands and as he shook my hand a smile of gratitude came over that stern wrinkled face that I shall never forget. I asked him further about his boy, and he said that he was well and strong and able to ride and lasso horses. He told me that he had heard that I had moved to Tuba, and he had come to express their gratitude for my services. I told him that I appreciated his gratitude for what I had done, but tried to explain to him that they owed much more gratitude to the people of the United States and their great government who had sent me there to help those Indians who needed the aid of the white medicine man. A puzzled look appeared on his face, and in his own peculiar way he replied: 'You are the only white man who saw my son while he was sick, and now he is well and strong. We are both happy, to you we are grateful.'"

A list of these Indian Service Stations will be found in the Appendix.

CHAPTER XIII.

Sanitary Engineering.

In the preceding chapter we referred to the work of the medical staff of the Indian reservations. We will dwell at some length upon the more extended work which has been done by the sanitary engineers in the Panama Canal Zone and in the Philippine Islands. Considering the effectiveness of the work in these regions as suggesting the possibilities of rendering habitable large areas of the tropics and semi-tropics, one readily sees the almost boundless fields which are open to the medical men of the next generation.

The Isthmian Canal Commission was organized for the purpose of making the Panama Canal Zone safe for those who were to undertake the construction of the canal. The commission was vested with extensive powers and the strictest kind of laws were formulated for the government of the country. The medical staff numbers sixty-nine physicians. These men receive an entrance salary of $1,800 a year with ample expense allowance.

The sanitation of the Canal Zone was the most important preliminary work in the building of the canal; it made the long-dreamed-of canal across the isthmus a possibility. The story of the conquest of disease, especially of yellow fever and malaria, reads like a fairy tale.

The great obstacle in the way of the building of the canal by the French Company was not money, organiza-

tion, engineers nor machinery, but a scarcity of men on account of the enormous losses by death. The French Company tried to build the canal through this yellow fever and malarial infected zone—an impossible undertaking, as we now see things. The project was doomed to failure without laborers, and men would not dare to go to work in an atmosphere infested with an enemy that caused the death of 240 per year out of every 1,000 of the workmen. The problem of prime importance was how to make the canal zone healthy.

The Surgeon-General of the United States Army recommended Dr. William C. Gorgas, as the best fitted officer for the head of the Sanitary Commission. Colonel Gorgas was the medical officer who had charge of the crusade against yellow fever in Havana, during the occupancy of Cuba; and under his supervision Havana was freed from yellow fever for the first time in one hundred and forty years. There was nothing miraculous in this performance; it was but a practical application of scientific discoveries. One of these was the discovery of the disseminating cause of yellow fever. It helps us to understand this kind of work to follow those who made this discovery.

The Surgeon-General of the Army appointed a commission, known as the Reed Commission, composed of Drs. Walter Reed, Jesse W. Lazear, Aristides Agramonte and James Carroll to study the disease and find its cause. The commission naturally proceeded to prove or disprove the theories which were held regarding this disease, and to determine whether it was spread by transmission through air or by infection in the same way as measles, scarlet fever and other communicable diseases are transmitted. In order to test out this

source of the disease an experimental camp was constructed at Havana, which was absolutely insect proof; and the volunteers from among the American soldiers and doctors were housed in the camp for twenty consecutive nights, sleeping on beds on which yellow fever patients had slept. There was no effort made to cleanse the bed linens, but instead of cleansing, the bed linens were intentionally soiled by the vomited matter of yellow fever patients. The men also donned night clothes which had been worn by persons who died of yellow fever. One hears of many heroic deeds performed by individuals and soldiers in the field, but very few deeds have been more heroic than this test taken by Dr. Robert P. Cooke, U. S. A., and six privates of the hospital corps. Each one knew of the fatality of yellow fever. None developed the disease. This was conclusive evidence that yellow fever was not communicated by direct contact, but by other channels.

The next clue investigated was one advanced by a Dr. Carlos Finley, of Havana. It was the "mosquito theory." The preliminary investigation showed very strong evidence favorable to this theory, but conclusive evidence was lacking until an actual test was made upon human beings. While there are about seven hundred species of mosquitoes, the evidence pointed to the stegomyia as the species that carried the disease. The commission procured eggs of this variety and allowed them to develop in captivity. Upon studying this species of mosquitoes the fact developed that the males were not equipped with a "hypodermic needle" or sucker, and consequently could not carry yellow fever. It also developed that the mosquito for sustenance needs only vegetable juices. A more surprising discovery was made

—that while the female stegomyia needs no animal blood for sustenance, she does need it in order to lay eggs. The female did not lay eggs until she sucked some animal blood. This explained why the female alone possessed this biting apparatus.

The commission allowed the female stegomyia, held in captivity, the privilege of biting yellow fever patients; and then all was ready for the test. Who were the first volunteers deliberately to allow these mosquitoes to bite them in order to prove or disprove a fanciful theory? Dr. Carroll and Dr. Lazear, two of the commissioners who were conducting the investigation, submitted themselves. They both developed yellow fever, and Dr. Lazear died within five days from the time he was stricken. "Almost at the beginning of what promised to be a life full of usefulness and good works, and dying he added one more name to that imperishable roll of honor to which none others belong than martyrs to the cause of humanity" quoting Dr. Reed's words.

This experiment was repeated with other volunteers, and the mosquito theory was verified. A few heroic lives were sacrificed, but through this sacrifice, Havana and later Panama were ultimately freed of the dreadful scourge, and as a result the Canal was built without the heavy toll of the days of the French Canal Company's operations.

The United States averaged 39,000 employees on the canal for 10 years, with a death rate of only 14 per 1,000. The sanitary commission of the Canal Zone had to destroy all breeding places of the mosquito in order to eradicate the diseases of malaria and yellow fever, as both diseases are disseminated by mosquitoes, though by different species.

SANITARY ENGINEERS SUPERVISING THE DRAINING OF A BREEDING PLACE FOR MOSQUITOS

Itinerant Physician at Work in the Philippines

CHAPTER XIV.

The Philippine Service.

When Congress reorganized the government of the Philippine Islands, a special medical service and public-health department was constituted to direct the sanitation; control the epidemics; prevent the introduction of plagues; regulate the manufacture and sale of foods and drugs; exercise supervision of water supplies and the building of tenements; to establish, wherever necessary, hospitals and asylums and to regulate the practice of medicine. In the continental United States some of the governmental machinery for public-health work is under the control of the national government, part of it is supervised by the state and part by the municipalities, and some by privately supported organizations. The vagaries of our patchwork system can be more readily understood after a consideration of the complete modern system which was created for these islands.

When the American army of occupation came into the islands, they found malaria, the bubonic plague, typhoid fever, dysentery and cholera everywhere. The great cities were at once transformed. Wholesome artesian water supplies were provided for; sewerage systems were instituted; vermin-infested old buildings were removed; the milk and food supplies were carefully inspected; dance halls and public assemblies were regulated; hospitals and free clinics were founded; medical and training schools for training native physicians and nurses were instituted; and research laboratories for studying climatic conditions and tropical disease were established.

The duties assigned to the bureau of public health were to include not only those usually imposed upon similar departments in the United States, such as the collection and compilation of vital statistics and the protection of the public from communicable diseases, but also to embrace the distribution of certain charitable funds; the care of the insane; the supervision of orphans and the aged; the supervision of hospitals, the hygienic and medical care of over 12,000 civilian employees; the administration of the food and drug act; the performance of coroner's duties; the examination of candidates for the public service; the supervision of sanitary and housing regulations and the control of water supplies.

It will thus be seen that the members of this service must be skilled in administrative work as well as in medical practice; sanitary engineers as well as trained investigators; and that their work is to a much larger extent preventative than curative, than in the American communities, where officials are hampered on all sides by restrictions. Abroad they are in positions to work out gradually such service as progressive medical men have been seeing in their dreams for many years.

As the islands become more prosperous they will afford, no doubt, fine fields for private practitioners. With a population of over 8,000,000 there are now only 620 physicians in the islands, not including the untrained medical native men. In Bana, with a population of 39,000, there is only one physician; in Batanges, with 33,000, only four; in Baybay, with 23,000, only one; in Cadiz, with 20,000, one; Dumaguete, with 15,000, four; in Calbyog, with 16,000, one; in Caragayra, with 17,000, one; in Tabaco, with 22,000, one; in San Pablo, with 22,600, three; and in Jaro, with 10,600, two.

With the influx of Europeans and Americans, the development of manufacturing industries and the larger education of the natives there will be a demand for more trained men, not only in these larger cities, but in more remote districts.

The private practice of medicine is regulated in the same way as in the states, the bureau of health having control of the licensing of physicians.

Applicants for admission to this service and candidates for license to practice in the islands must be graduates of reputable medical colleges recognized by the Board of Health. They must pass such examinations as the board directs, which include the subjects usually prescribed by the board of medical examiners of the states, in addition to the medical laws of the islands; candidates, of course, must learn the languages which are spoken in the districts to which they are sent, or which they select for practice.

The advance guards of modern science, by performing in these remote regions marvelous changes, win such rewards of gratitude and esteem as do the medical men at mission stations, of whom we will treat in another chapter.

It was in the Philippine Service that one of the American physicians made a discovery in medicine that has been of great service to all mankind—the use of ipecac and its active principle in the cure of dysentery. The investigation which he conducted proved that the disease was due to the amœba, and that the amœba could not live in a system thoroughly impregnated with ipecac. It was through the further development of this discovery that, today, dysentery, typhoid fever, pyorrhea alveolaris, etc., are treated much more intelligently.

CHAPTER XV.

The Federal Public Health Service.

Under the provisions of the constitution of the United States empowering the federal government to regulate the admission of immigrants and to promote the general welfare of the people, from the beginning of our national existence, officers were stationed at the chief points of entry to prevent incoming vessels from landing plague-stricken passengers or members of crews, and gradually, under the supervision of the Department of the Treasury, the United States Public Health Service has been developed. Few people have any conception of the extensive work which is being carried on by this department, which is just as active in protecting the people of the country as is the army and navy.

The work of the department is organized under the following divisions: scientific research and sanitation; foreign and insular quarantine and immigration; interstate quarantine; sanitary reports and statistics; marine hospitals and relief; personnell and accounts; miscellaneous.

Each of these divisions is in charge of a medical officer who is responsible for its operations to the surgeon-general of the service.

The staff of the department at the close of the year ending June 30, 1915, consisted of the following:

Surgeon-general	1	Assistant surgeons	63
Assistant surgeon-general	1	Acting assistant surg's	262
Senior surgeons	12	Internes	21
Surgeons	70	Medical inspector	1
Passed assistant surg's.	39	Quarantine inspector	1

Hospital and quarantine nurses and attendants 1,429

This service must be attractive, because during the year considered there were no resignations from the service, although during the year five officers were placed under "waiting orders" on account of illness, which means that they were relieved from duty on full or half pay.

The rate of pay is as follows: assistant surgeons receive $2,000; passed assistant surgeons, $2,400; surgeons, $3,000; senior surgeons, $3,500; and assistant surgeon-generals, $4,000 a year. When quarters are not provided, commutation at the rate of $30, $40 and $50 a month, according to the grade, is allowed.

After four years' service, assistant surgeons are entitled to examination for promotion to the grade of passed assistant surgeon.

All grades receive longevity pay, 10 per cent. in addition to the regular salary for every five years' service up to 40 per cent. after twenty years.

The tenure of office is permanent. Officers travelling under orders are allowed actual expenses.

Admission to the service is governed by the following regulations contained in a circular letter which is sent to applicants:

Boards of commissioned medical officers will be convened to meet at the Bureau of Public Health Service, 3 B Street, S.E., Washington, D. C., for the purpose of examining candidates for admission to the grade of

assistant surgeon on the Public Health Service, when applications for examination at these stations are received in the Bureau.

Candidates must be between 23 and 32 years of age, graduates of reputable medical colleges, and must furnish testimonials from two responsible persons as to their professional and moral character. Service in hospitals for the insane, or experience in the detection of mental diseases will be considered, and credit given in the examination. Candidates must have had one years' hospital experience or two years' professional work. They must be not less than 5 feet, 4 inches, nor more than 6 feet, 2 inches in height.

The following is the usual order of the examination: physical, oral, written, clinical. In addition to the physical examination, candidates are required to certify that they believe themselves free from any ailment which would disqualify them for service in any climate, and that they will serve wherever assigned to duty.

The examinations are chiefly in writing, and begin with a short autobiography of the candidate. The remainder of the written exercise consists of examination in the various branches of medicine, surgery and hygiene. The oral examination includes subjects of preliminary education: history, literature and natural sciences. The clinical examination is conducted at a hospital. The examination usually covers a period of about ten days.

The officers of the medical corps examine the papers of all incoming vessels. The medical officer of all ships upon arriving at a port must state the health condition of the port from which the ship comes as well as the conditions of the ports at which the ship touched during

the voyage, and enumerate any cases of sickness which occurred during the voyage. The medical inspectors may examine all the passengers and crew and require the fumigation of the cargo; and in suspected cases they may cause the vessel or passengers who were exposed to contagion or infection to be detained in quarantine sufficiently long to give any suspected diseases the full period of time to develop.

The department may also send inspectors to suspected foreign ports to scrutinize cargo, crew and passengers of vessels destined for American ports, to prevent the spread of communicable diseases.

Officers are stationed as sanitary guards at Santiago, Chile; Callao, Peru; Guayaquil, Ecuador; Rio de Janeiro, Brazil; La Guaira, Venezuela; Calcutta, India; Naples, Italy; Libau, Russia and in several Cuban and Mexican ports, and in such other foreign ports as deemed necessary.

One can hardly appreciate the value of the service which the government is rendering to its people through this department. Although Asiatic ports from which vessels sail are often infected with bubonic plague, cholera, smallpox or other diseases, yet these diseases have only on a few occasions been introduced into this country. Several years ago bubonic plague did develop upon the Pacific coast, and but for the persistent, thorough work of these medical officers, the whole country from coast to coast might have been infected.

This work at the ports of entry is not by any means all the work that is done in disease prevention by this department, but investigations of disease epidemics are carried on continually. During 1914, important investigations of typhoid fever, cholera, plague, smallpox,

typhus fever, tuberculosis, trachoma, pellagra, poliomyelitis, malaria, dengue, hookworm disease, water pollutions and milk hygiene have been conducted.

The officer detailed to investigate the disease among the mountain whites in Tennessee, and among the natives of Porto Rico, known as the "lazy" disease, because all the inhabitants afflicted with the disease became lazy, indolent and sleepy, found the cause of the disease to be a hookworm. The officer detailed to this investigation also developed a treatment for the cure of these afflicted mountain whites.

Another officer was detailed to investigate the Rocky Mountain spotted fever, and found the cause to be a microörganism disseminated by a tick. The name of Surgeon T. B. McClintic, who sacrificed his life to the cause of science in order that this fever might be eradicated, belongs with those heroes who have given up their lives for the common good of mankind.

Until recent years, there was possibly no familiar disease that was as little understood by the public and physicians as rabies. The public health service detailed an officer to investigate this disease, its cause, localities and treatment. His report clears up the mysteries of the disease, and will eventually aid in its complete eradication.

The department maintains a hygienic laboratory where much of the work in connection with these investigations is carried on. In this laboratory the trained men of the service also determine the merits of the new medical discoveries which are announced from time to time, and valuable service has been rendered to the public in exposing frauds.

There are also maintained 22 hospitals on the seacoasts, lakes and rivers for the care of seamen. During the year closing June 20, 1915, 40,604 seamen were treated at the various stations. Of this number over 14,000 were treated in hospitals owned by the government. The marine hospitals are located at: Mobile, Ala.; San Francisco, Cal.; Delaware Break Water; Key West, Fla.; Cairo, Ill.; Chicago; Evansville, Ind.; Louisville; New Orleans; Portland, Me.; Boston; Vineyard Haven, Mass.; Baltimore; St. Louis; Wilmington, Del.; New York; Memphis; Cape Charles, Va.; Port Townsend, Wash.

Assistant surgeons, whether in quarantine stations, marine hospitals, hygiene laboratory or in field service, work under the direction of their superior officers; and they must accustom themselves to such a rigorous system of routine of work and report as is unknown to the general practitioner. Passed assistant surgeons are more independent, and they may be assigned to special duty in connection with the other departments of the government or in cooperation with the health service of the several states and cities. Whenever they are assigned to special duty with other branches of the government, the medical officers are accorded the honor due to officers of the highest rank.

The rank of surgeon can only be attained by promotion as vacancies occur, and then only by seniority.

CHAPTER XVI.

The Public Health Service.

Unlike the well-organized, unified public health and medical service of the Philippines, the machinery for doing this work in the States is not always so well coordinated. This is because the functions which the state and local governments exercise in these fields have grown from the very insignificant beginnings which date back to the organization of our government, when men acknowledged little collective responsibility for the welfare of their fellows. These functions of government deal with the protection of the citizens from infection and contagion, from contaminated food supplies and polluted waters. These functions are exercised by the boards of health of the larger cities within their own areas, and by the state boards of health through local officers in the country districts. The state medical service generally has to do with ministering to the inmates of state institutions, and the county and city medical service take care of the needs of those in institutions under the jurisdiction of the local governments; while in many states there is a separate medical service for the poor which is administered through the boards for poor relief and charity.

This work is as yet very unevenly developed and practices vary in the several states. To convey an idea of the operations of these branches of government and to show the large possibilities in this field, a somewhat de-

tailed description is given of the organization and operations of the department of health of the state and city of New York.

The state paid in 1914, to sanitary, medical and scientific officers connected with the board of health and other departments of the state and county governments and to medical officers of institutions, over half a million dollars; and in the one single large city of New York the expenditures of the department of health alone were $3,363,767.85.

The state has a commissioner of public health with an annual salary of $8,000; deputy commissioner, at $5,000 and an advisory council of eight members, each of whom receives $1,000.

There is a department of sanitation and hygiene, which passes upon the plans for water supply systems and sewerage systems of cities and villages, investigates complaints of stream pollution, and looks into the causes of typhoid fever epidemics. This is in charge of a chief sanitary engineer with a corps of trained assistants who cover the state.

The department of laboratories and research has charge of the preparation and distribution of antitoxins. Its medical officers and bacteriologists are at the command of the physicians and health officers of the state.

The division of child hygiene supervises the child welfare agencies of the state and the public and private schools.

The department of vital statistics collects from the county officers of health, statistics relating to births and deaths.

The department of publicity and public health education employs a corps of lecturers, issues bulletins of in-

formation for the people and plans and manages exhibits intended to arouse the people to the necessity of sanitation and hygiene.

The division of communicable diseases is constantly on the watch for any outbreaks, and is prepared to check and control the spread of disease, in the same way that a fire department operates or the state militia acts when an enemy threatens the peace and comfort of the people.

Another department regulates and supervises the operation of cold storage plants and the distribution of food from these places.

The psychiatric institute and the institute for the investigation of malignant diseases have their own organization of experts and their own laboratories.

The heads of these several departments are paid $4,000 a year, the assistant directors $3,000, and the members of the scientific forces, whether physicians, bacteriologists, chemists or sanitary experts, are selected by competitive examinations with salaries ranging from $1,200 to $2,500.

The health officer of the port of New York is a state official who is paid $12,500 a year, and has a deputy at $4,000 and three assistants at $3,000. These men have perhaps the most autocratic power of any officials in our system of government.

Outside of the department of health the state has a medical adviser to the workingmen's compensation commission at $4,000 a year, a medical examiner at $3,000 and an assistant at $2,000.

The superintendents of the state insane asylums receive from $4,800 to $6,000 with maintenance, and the physicians from $1,200 to $2,800. The physicians to the school for the blind and the deaf, the homes for

epileptics and feeble-minded, the houses of detention and the prisons of the state, are designated to act as such from among the practising physicians of the communities in which these institutions are located, and they change whenever the political complexion of the state government changes.

Much of the work of the state department is done through physicians who act as local health officers and who are paid according to the amount of time which they give to this service. The county board of health officers usually act as reporters of conditions to the state board of health, and direct the medical service for the relief of the poor.

The most completely developed public health systems are found in our large cities. In the city of New York in 1915 the total number of employees of the department of health was 3,421. Of course, all of these were not medical officers, but a description of the work of this department will show how rapidly this new field for medical men is expanding.

The commissioner of health, the chief of police and the health officer of the port constitute the board of health. There is also an unpaid medical advisory board, and a board of honorary consultants. The head of the administrative force is the commissioner of health ($8,000), a sanitary superintendent ($7,000), and a secretary to the board of health ($5,000). The force in the office of the secretary handles the correspondence, keeps the records, attends to the purchase and distribution of supplies and audits the accounts of the department. It is made up of men and women whose training has been along commercial lines.

The registrar of vital statistics ($5,000) and his 5

assistants ($3,000) are medical men. They superintend the collection of statistics of births, deaths and marriages, issue burial permits and make searches for missing persons. In the department, in addition to a force of 53 clerks, copyists and stenographers, there are four medical clerks ($1,200), and a medical inspector ($1,500).

The superintendent of the sanitary department investigates complaints about noises which disturb the comfort of people, supervises dangerous trades, has charge of the suppression of mosquitoes and the removal of the bodies of the dead animals. His force consists of five sanitary supervisors ($3,500) and a force of medical and sanitary inspectors ($1,200–$2,550).

The bureau of infectious diseases collects from physicians the reports of the appearance of such diseases, issues a daily bulletin showing their location, establishes and enforces the observance of quarantine regulations, disinfects premises, disinfects or directs the destruction of infected goods, attends to the vaccination of patients in public institutions, supervises the tubercular hospitals and camps, and the laboratory for Pasteur treatment. The medical staff consists of a director ($5,000), an assistant director ($4,000), 5 chiefs of divisions ($3,500), 4 borough chiefs, 17 physicians in charge of branch offices and hospitals, 44 medical inspectors ($1,200 to $3,000), 62 attending physicians ($300 to $600), besides a force of bacteriologists and laboratory assistants.

The bureau of laboratories attends to the manufacture of vaccine virus, antitoxines and other biologic products which are used for the diagnosis, prevention and treatment of diseases. There is a clinical depart-

ment which advises and instructs physicians in the use of these products; a laboratory for the examination of food and milk; a laboratory which makes bacteriological examinations for other departments and for physicians. The medical staff consists of a director, 7 assistant directors, 25 bacteriologists and 42 laboratory assistants, all of whose pay corresponds with the pay for services of the same kind in other departments.

The bureau of child hygiene is in charge of a director ($3,000), an assistant director ($2,550) and 5 chiefs of divisions, 5 borough chiefs and 14 supervising inspectors. There are 98 school medical inspectors ($1,200–$1,500): 9 examiners for employment certificates; 7 inspectors of child welfare institutions; 18 attendants at clinics for school children; and a large force of non-medical assistants, inspectors and nurses, attendants at milk stations, orderlies, watchmen and cleaners. This department looks after the medical inspection of school children, conducts 55 milk stations for the distribution of properly prepared milk for infants, supervises the midwives, operates clinics for children and controls day nurseries, and issues employment certificates to the children who leave school.

The director of the bureau of food inspection makes and enforces the regulations for the manufacture and sale of food products, including milk and beverages, and the sale of drugs and patent medicines. Samples of milk are taken at the dairies and frequently examined, and regulations are made for safeguarding of the milk supplies. Over 4,000 bakeries are regularly visited and inspected, slaughter houses and retail meat markets are also under the jurisdiction of this bureau.

The entire force of the department in 1915 was 152, but only a few of the chief officers were medical men.

There are only three medical men in the staff of the bureau of publicity. During the year 1914, this department gave lecture courses to medical and food inspectors and to nurses, noonday talks to factory employees, conducted an anti-tuberculosis campaign, managed several important health exhibits and distributed over 200 different health bulletins. The bureau of hospitals of the department of health conducts three hospitals for contagious diseases and one country tuberculosis hospital or camp. While there are over a thousand employees under the jurisdiction of the bureau, the medical staff consists of a director, 26 hospital physicians and a varying number of internes and medical inspectors. The hospital physicians receive from $1,200 to $1,800 and maintenance, and internes $120 a year and maintenance.

This elaborate organization does not include the entire medical service under the direct control of the city. The independent Bellevue and Allied Hospitals under the direction of a superintendent ($6,000), director of laboratories ($5,000), and assistant medical superintendent ($2,500), has 4 attending physicians giving part time service ($1,000), 38 out-patient's physicians ($600 to $900), and a force of pathologists, radiographers and laboratory assistants.

There are also four medical examiners for the school department who pass upon the physical qualifications of applicants for appointment to the teaching staff, 25 surgeons of the police department ($3,500), and 11 visiting physicians to prisons ($1,200–$1,800). The department of charities has a medical superintendent ($6,000). The superintendents of the hospitals under

DINING-ROOM IN OTISVILLE, N. Y., TUBERCULOSIS HOSPITAL

the control of this branch of the city government are paid $4,000, and the physicians from $1,200 to $2,550.

This elaborate organization has been gradually developed. At present, dental clinics for school children are being tried under the auspices of voluntary organizations. If this experimental work proves successful, this work will become one of the functions of the city government. Just in this way the work of the department of public health has been extended in this city and is now being extended in all leading states and cities. It has fully justified itself not only in this but in European countries. The whole movement is a part of the movement for increasing and promoting the economic efficiency of all citizens, and it is a result of the recent discoveries concerning the real causes of infectious and contagious disease. These discoveries have shown that these public health measures must be supported by the citizen, not alone to help his fellow but for his own protection. At present, however, in most of the cities this kind of work, to which the public is committed, is but partially done. In the matter of school medical inspection, it will be readily seen that 98 medical inspectors for the examination of over 900,000 school children is a very small number with which to realize the ideals of the promoters of this kind of public service; every day we realize that while the principle of food inspection is a good one, the provisions which have been made for the inspection of retail food stores are wholly inadequate. All this means that this field will be greatly expanded during the coming decades.

The heads of these public-service departments are usually appointed from among the men who have established reputations and are specialists in their subjects;

but frequently the appointments are made because of political favoritism. In most of the states and cities the subordinates are selected by civil-service tests which are open alike to men and to women. Young medical men who accept appointments of this kind serve for a limited number of years and then turn to private practice. In the past it has been the custom of these public officials gradually to build up a private practice while holding public appointments. This cannot at present be done so well. The salaries which are paid in the public service are gradually being increased, and the public is demanding full service from its employees.

These salaries are likely to be increased as the demand for trained and experienced men grows. That the supply of such at present is not equal to the demand is proven by the fact that special postgraduate courses for health officers have been established by Harvard University, Tulane University and the universities of Pennsylvania, Michigan and Wisconsin.

At present the positions in the public medical service which are under civil-service regulation are open to graduates of recognized medical colleges under about the same terms as those under which they enter the examinations for licenses to practice medicine, but for the sake of efficiency the new recruit for these services is gradually shifted to special work and the service itself has opened up many new lines of specialization.

CHAPTER XVII.

Hospital Service.

There are nearly 5,000 hospitals, public and private, in the United States, to say nothing of the large number of hospitals which are maintained by corporations for the treatment of their employees. The operations of the hospital staff of the Southern Pacific Railroad for 1914 show a total of 81,525 cases. This great development of this kind of service in all sections of the country calls for specialists in hospital administration. The general practice of medicine is not such as to give men a chance to develop executive power while getting experience in actual practice; so for this reason the demand for men in this service is greater than the supply, and with the continued increase in the number of hospitals this is likely to continue.

The real development of the modern general hospital for the treatment of disease dates back to 1861, when Lister gave to the world the germ cause of wound infection. He proved that wounds, whether accidental or surgical, will heal quickly if kept free from bacterial contamination. Before this discovery all kinds of ointments and plasters were applied to wounds; today the applications which are made are intended to destroy or to prevent bacterial growths; and going upon the principle that nothing is clean which has not been sterilized, the modern hospital has sprung into existence. Conditions have been created under which the patients can

be surrounded with that absolute cleanliness which is of prime importance.

Modern hospitals for the treatment of the sick, as distinguished from asylums and hospitals for defectives and dependents, may be built and supported by public taxation, and have free wards for the treatment of the poor; they may be built by private subscriptions and supported by fixed charges or they may be built partly by subscriptions and partly by public funds and supported by appropriations from the public funds and by fees.

In the smaller communities the general hospital may admit all kinds of cases and have a surgical and a medical department, each of which has its subdivisions for treating special types of cases. In large cities there may be special hospitals with their own rules and regulations, which are especially designed to facilitate the handling of particular infirmities.

The management of hospitals is usually vested in a board of trustees appointed by the governor in the case of state institutions; by the mayor or health board in the case of city institutions; and in various ways in the case of private or semi-public institutions. These trustees have the entire control of the business management, the appointment of the superintendent and, sometimes, the staff of physicians; but recently the tendency has been to give the appointment of subordinates to the superintendent.

The superintendent, although the executive head, is not expected to render medical service; but he may direct the internes in the treatment of surgical cases in the absence of the chief surgeon. Although the superintendent of the public hospitals is usually appointed

St. Christopher's Hospital for Babies, Brooklyn, N. Y.

because of his political affiliations, he is rarely disturbed if his party goes out of power while he is in office. An educated public sentiment is beginning to recognize that officials whose value depends upon their experience shall not be removed from positions which they are satisfactorily filling.

The successful hospital superintendent is a man of a high type of administrative ability. His medical staff consists of a visiting body of practicing physicians among whom jealousy may develop discords; the house physicians are young physicians who are continually changing and the internes remain hardly long enough to learn the regulations of the institution; the patients come and go; conflicts may arise between the practicing physicians who bring their patients to the private wards; and the supervision of nursing requires discipline of the strictest kind. So we have a call here for a physician with medical knowledge and skill sufficiently extended to command the confidence of the best of his profession; diplomacy and tact to bar all discordant influences; sympathy for the suffering and their friends; and ability to manage his internal affairs with the strong hand of rigid discipline.

The internes, who are selected from among the graduates of the medical colleges, usually serve for a year. The house physician begins his service as a junior or assistant, and in due time takes the place of the retiring senior. The service is so arranged that the house physicians serve in turn in the different departments, in order that they may get actual experience in the treatment of all kinds of medical and surgical cases. The pay in the hospitals follows generally the schedules given in the preceding chapters.

The hospitals for defectives, whether public or private, require men with special training. The physicians as well as the superintendents are more permanent and give their whole time to the service. The pay is fairly remunerative and the work appeals especially to those who dislike the business side of private practice. The work in the insane hospitals from the medical viewpoint is very interesting, and it is such as to satisfy the best of altruistic instincts.

The work in these institutions is more systematic than in general practice or the work of the general hospital to which patients continually come. An insane asylum has from four to ten regular physicians for each thousand patients. This gives opportunities for close and careful study of cases, and for keeping careful and systematic records. Ample clinical facilities, laboratories and libraries are supplied.

Upon arrival a patient is kept in the reception wards for examination; and in due time a staff conference classifies him, prescribes his treatment and assigns him to the care of some particular physician.

In the New York hospitals for the insane, the pay for superintendents is from $4,800 and maintenance to $6,000 in the larger hospitals. The present heads of these institutions in the state average seventeen years of service; the physicians, receiving from $1,200 to $2,800 and maintenance, average very short periods of service, except the women physicians. In 1914 there were 17 receiving from $1,200 to $1,600, and averaging 11 years of service.

It may be interesting to note that as the public has been educated to the wisdom of supporting the unfortunate poor insane in public hospitals, there has been a

corresponding increase in the number of private hospitals and sanitariums for the treatment of the nervous disorders of the members of families in better circumstances. These hospitals are comparatively small, and the physicians have more general responsibility than in the public hospitals in which the work is more specialized.

Sanatoriums for the treatment of chronic diseases are becoming more numerous and offer opportunities for physicians. As the public has begun to appreciate the modern hospitals with all conveniences and equipments as the best places for the treatment of acute diseases, so, too, it is appreciating the modern sanatoriums for handling chronic diseases. The sanatoriums are specialized institutions, and admit only cases of the special class for which they are equipped. The climate, location, surrounding and equipment are all selected so as to conduce to the comfort and speedy recovery of the patients. A dry atmosphere, an even temperature, continuous sunshine and pure air are very vital factors in the treatment of tuberculosis; so for this reason the sanatoriums for the treatment of tuberculosis are mostly found in Colorado, New Mexico and Arizona.

The sanatoriums for the treatment of arthritis, rheumatism or gouty diseases are usually located at some saline or lithia springs. In this class of cases the climate is immaterial, but the medicinal drinking water is necessary, and the rest of the equipment can be supplied. The sanatoriums are therapeutically classified according to the diseases treated, as follows: asthmatic affections; auto-intoxication; anemia and general debility; Bright's Disease; catarrhal diseases of the di-

gestive tract; catarrhal diseases of the nose, throat, ears, respiratory tract; chronic alcoholism; chronic articular rheumatism; chronic malarial poisoning; chronic metallic poisoning; diabetes mellitus; gouty affections; heart disease; liver and gall duct affections; nervous diseases and neurasthenia; tuberculosis; syphilis; and skin diseases.

One may readily see the opportunities these institutions offer to those who wish to specialize in any one of these lines of internal medicine. This is especially true in the treatment of nervous diseases, because nearly all physicians and the public generally appreciate the fact that to treat nervous or neurasthenic patients successfully, they must be taken away from their everyday environment; and for this reason the field of sanatorium practice is promising. The fees obtainable in such a field vary with the institutions. In most cases the sanatoriums have been organized and are managed by physicians as the head of stock companies. The figures showing their net earnings have not been obtainable.

Many young physicians may be forced to accept positions which will prove immediately remunerative. Appointments to private sanatoriums are not difficult to secure and although the salary may be low, the experience is valuable and comfortable maintenance is assured. A list of these privately controlled institutions will be found in the Appendix.

NUMBER OF HOSPITALS IN 1916.

	Hospitals.	Private Sanatoriums.		Hospitals.	Private Sanatoriums.
Ala	64	7	Nebr	108	10
Ariz	51	9	Nev	30	0
Ark	62	18	N. H	56	5
Cal	422	109	N. J	77	17
Colo	95	17	N. Mex	21	13
Conn	90	22	N. Y	611	86
Del	13	1	N. C	94	28
D. C	70	1	N. Dak	57	2
Fla	42	16	O	341	34
Ga	98	31	Okla	51	21
Idaho	57	3	Ore	85	19
Ill	240	40	Pa	468	46
Ind	72	22	R. I	52	2
Ia	183	18	S. C	46	7
Kan	116	11	S. Dak	47	3
Ky	99	14	Tenn	101	15
La	63	8	Tex	113	78
Me	48	6	Utah	32	3
Md	123	20	Vt	25	5
Mass	242	48	Va	119	15
Mich	226	28	Wash	165	21
Minn	227	23	W. Va	58	8
Miss	35	13	Wis	109	
Mo	207	34	Wy	22	
Mont	76	2			

CHAPTER XVIII.

Laboratory Work.

The changes which have been made in the practice of medicine by the advances in biology, physics and chemistry have greatly increased the amount of laboratory work which must be done for the average practicing physician.

The older physicians neither have the training nor the inclination to do this work for themselves; and in hospital organization, efficiency calls for specialists in this line. These laboratory specialists need not necessarily be medical graduates; but in this connection this field deserves consideration because it may prove inviting to those medical graduates who find, after having made their preparation, that they have such a repugnance to morbid humanity that their success in general practice would be problematical. Moreover it requires for patient laboratory work just the careful deliberate type of mind which some of those possess who shrink from those situations which require ready resourcefulness.

As set forth in a previous chapter, the state and municipal departments of health have their own laboratories. The hospitals likewise have their own force of laboratory assistants. There are also research laboratories and the commercial establishments in which medical supplies are prepared and tested; and in some

cities specialists establish themselves by doing work for the private physicians.

Examinations of blood are to be made to determine the presence of evidence of typhoid fever or malaria; mucus from the throat for germs of diphtheria; sputum for tuberculosis; spinal cords of animals for rabies; drinking water for evidence of pollution; drugs for adulterations; tainted food supplies; and so on through an almost endless series. The water supply companies have their own establishments in which samples of drinking water are being continually tested; and on account of the heavy penalties which are imposed upon the vendors of impure milk, the milk companies in our cities are compelled to employ specialists for examining their supplies.

This field is particularly inviting to the scientifically trained women; the associations are good, the surroundings attractive, and the pay compares favorably with the earnings in those fields usually entered by women.

Each one of the lines of special laboratory work has its own methods of procedure, and the routine of different laboratories doing the same kinds of work may vary greatly.

The Bureaus of Standards of several cities in which the subject of salaries has been carefully considered have recommended schedules of pay for this service as follows: laboratory assistants, in New York, from $600 with annual increases of $120 to $1,200; in Chicago, from $780 with annual increments of $60 to $960; in St. Paul, $600 with annual increases of $60 to $720; in Portland, Ore., from $780 to $1,200; for assistant bacteriologists, in New York, from $1,300 to $2,100; in Chicago, from $1,200 to $1,440; for bacteriologists,

in New York, from $2,280 to $3,420; in Chicago, from $1,620 to $1,860; in Philadelphia, from $1,000 to $2,000; in Cleveland, from $1,200 to $2,000; in Buffalo, from $2,000 to $2,300.

Candidates are usually selected from the civil-service lists, and men and women are admitted to the examination on the same terms. It is true that many of the examinations which are given for the purpose of selecting laboratory assistants can be passed by those who have had a good high-school course, but the chances of such persons for promotion will be very limited. A college course laying stress upon practical work in biology and chemistry, or the laboratory work of the usual medical course, is generally a sufficient preparation for admission to subordinate positions in this service. Specialization either in college or in laboratory service is needed to qualify for advanced positions.

Several physicians with wide experience in this kind of work, upon being interviewed, expressed it as their opinion that the precautions are such that those who work in these testing laboratories do not take any special risks by engaging in this kind of work.

School Medical Inspector at Work

CHAPTER XIX.

Medical Inspection of Schools.

The movement for the medical inspection of school children hardly antedates the beginning of the present century. Like all such movements it has manifested itself in several distinct phases.

There is the period of argument. In this country the health authorities took the initiative. They argued that since contagious diseases are disseminated in crowded assemblies, the school should be inspected regularly in order to exclude children afflicted with contagious diseases.

This was the earliest argument used in favor of medical inspection, and it was a health measure in the interest rather of the public than of the individual. Epidemics in a community paralyze all commercial enterprises.

Later the scope of the argument for inspection was supplemented by the school authorities who found that many children in the public schools were physically handicapped in their studies; and as the state assumed the responsibility to train the children mentally, it was not unreasonable to assume that the state should safeguard the children against unfavorable physical conditions.

This period of argument was followed by a period of trial, through which we have passed. As a result we find that several states have passed mandatory laws compelling the local school authorities to make provision for doing this work, and hundreds of cities are

gradually building up medical inspection systems. This will mean that during the coming twenty-five years a very large force of properly trained men and women will be required for this kind of work in this country.

The nature and scope of the work will be understood from these regulations, which have been promulgated by the government of Prussia:

1. School physicians are to be appointed to all the schools of all the communities, large and small, and children without exception shall be subject to medical supervision.

2. Children must be examined by the physician upon admission to school; at least once during the school life, and be given a final examination upon leaving school on account of the choice of a profession.

3. Weak and sickly children are to be continuously superintended.

4. The school physician shall also have the oversight of the health of the teachers and janitors, and he shall be the expert counsellor of the board of education in all questions of school hygiene; he shall have a vote in the board of education, and in the teachers' training school he shall be the instructor in physical training and school hygiene.

In an enterprising school district in a western state, the school physician by energetic measures secured the immunity of the children of a district from diphtheria, while at the same time an epidemic wrought havoc in adjoining districts. The demonstration made it easy for the school boards to secure the necessary support for systematic inspection by salaried physicians. The general results have shown that the progress of many children in their school work is hindered by minor

physical defects which can readily be remedied. The uniform results of trial in different parts of the country have been such as to justify the contention of the early advocates of medical inspection, and the next step in the movement will be the organization of the work throughout the country.

In New York city it has been found that the force of approximately 100 physicians and 200 nurses will be wholly inadequate to handle the problem. Dr. Cronin, of that city, is of the opinion that there should be one physician and one nurse to each 2,000 pupils. In many of the cities of the country some local physician is paid a small annual salary for examining the children of one or more schools. There are practical reasons why the school physician should be a full-time salaried official who does not combine private practice with school inspection work. This plan is the general requirement in the English cities and country districts, and if adopted in this country it will open a field which will call for from six to ten thousand medical inspectors of schools.

The pay for service of this kind varies greatly. In New York city full-time medical inspectors are paid salaries ranging from $1,200 to $3,000; in Philadelphia the pay is from $1,400 to $2,400 with a chief inspector at $4,000; in Boston from $800 to $2,850; in Pittsburgh from $1,200 to $2,400. These schedules will attract young men at the beginning of their medical careers, but it is not likely to hold them longer than for a few years. The salary schedule is more likely to prove acceptable to women, and for this and many other obvious reasons this field is sure to become an attractive one to women graduates from the recognized medical colleges.

CHAPTER XX.

Medical Missions.

The mission boards or religious denominations send medical missionaries, men and women, to non-Christian countries as advance guards of the physicians of souls. Through these men, who minister to the physical distresses of benighted people, these organizations hope to establish such confidential relations and to convey such evidences of good will, that the work of the preacher of righteousness may be made easier and more far reaching.

As compared with the uncertain results of the crude treatment of unlearned native doctors, the medical missionary's skill in the art of healing is regarded by the ignorant and superstitious people with amazement and wonder, and his reputation soon spreads far and wide; so that both laborers and court dignitaries come to consult him.

It is true that European countries maintain in their colonial possessions, in connection with their official establishments, some trained physicians, but the influence of these men is confined to official stations and military posts; and in many populous districts there are millions who are never benefited by modern scientific medicine until the advent of the medical missionary.

After their establishment in a given locality, these medical missionaries spend much of their time as itinerants, thus increasing the area of their influences. In

these journeys they are compelled to work with very limited resources in the way of equipment and supplies. This develops resourcefulness; and, moreover, they must be strategists and diplomats to adjust themselves readily to new situations, and fit into the customs and habits of strange peoples; consequently this work is exceptionally well designed to develop in a young practitioner all his latent powers, through the unlimited range of experience which it affords. He must have self-reliance, for there are no opportunities for consultation; he must have dauntless courage, because his very successes are likely to be used by the jealous witch doctors to arouse hostility to him. "Surely the strange doctor must dig out the hearts of his patients; else how could he have such tireless energy, and how could he have such supernatural vision, if he did not feast upon the eyes of countless victims?" was circulated about a medical missionary in a remote Chinese village.

In their home station these missionaries usually have hospitals, connected with which are trained nurses, by whose aid the more difficult cases are treated.

Even with the facilities provided in the most favored fields, these practitioners are compelled to exercise an independence and self-reliance unknown to their fellows in well-organized communities. Take, for instance, the operation for the removal of cataracts. It is one of the most delicate operations in the field of eye surgery. The highest type of skill is necessary. Experience alone makes for skill in this delicate operation, in which the eye is penetrated from side to side, an open cut made which must be neither too large nor too small to insure a successful termination; and there is no guide except the judgment of the operator as to the size this

cut should be. The time to operate, the method of procedure, and many other things that enter in the case, must be decided by the judgment of the operator. The opportunities in this field are rich in India, Egypt, Siam and Arabia. Thousands of cases of blindness due to cataract are found in these countries, and with the exception of the British government medical service in India and Egypt, the afflicted must depend upon the medical missionaries. One medical missionary in India reported over 6,000 cataract operations.

Today the most noted cataract operator in the world, Colonel Smith, lives in India. He has given to science the results of his experience. He proves that by using a technic and method devised by himself, it is unnecessary to wait until the so-called "ripening" of the cataract takes place; but that the cases can be operated upon at any time after the vision gets dim, thus saving the patient in many instances a year or two of total blindness.

It must go without saying that the appointing bodies require that candidates for this work shall be consecrated Christian men and women, and also be fully versed in the science of medicine and skilled in the art of healing.

The pay of from $500 to $1,500 with professional and living expenses compares not unfavorably in purchasing value with the income-earning power of beginners in private practice at home; but such are the demands upon their sympathies in the foreign field that the purses of few can withstand the financial strain.

A recent census shows that there are 800 Protestant medical missionaries in charge of 698 hospitals and 979 dispensaries, and that they treated in 1914 approxi-

mately 10,000,000 patients. This manifestation of devoted self-sacrifice, on the part of highly trained men, as well as of the generosity of those who provide their support, must prove refreshing to those who turn with horror from the acts of the assumed divinely appointed rulers of European nations, who have in that same year hurled their subjects by the thousands to sure death.

Nor has this altruism been without reward to its practitioners. Through the studies of missionaries it has been found that the sleeping sickness of Africa could be controlled by the extermination of the fly which spreads it; that quinine is a remedy for fevers; that permanganate of potash is a proper prescription for the bite of the cobra, and so on through a long list.

Dr. Cyril H. Haas in a small tract used by the Students' Volunteer Movements, 125 East 27th Street, New York, gives a doctor's reason for going to China:

"The first of these reasons is because it is the dictate of mere common sense. I do not know of anything which we talked more about in our senior year than where we were going to practice. When I faced the last day of my senior year, I met a man who told me that everything was congested. I went into the city, but was advised that it took an average of ten years for a physician to become self-supporting. I went into the country, and physicians told me that I could do no surgery, because if I attempted it I was liable to make mistakes and my reputation would be gone. Where was a man going to practice? I saw in the *Journal of the American Medical Association* that we were pouring out of our medical colleges 4,000 young men every year, and that we only needed a possible 3,000 to fill the vacancies left by those who died. I saw that the Com-

mittee on Medical Education in this country was seriously considering the printing of pamphlets to send to high-school boys, urging them not to enter the medical profession, because the great influx of students made it impossible for them to find room in the profession in this country. I think that it is nothing more than common sense for a young physician, at least if he is a Christian, to look to some other country than this for practice.

"The second factor that urges me to go to another land is common duty. I have many times seen a vision of a city of 150,000 people in the center of Asia, outside of which there is a little hill, and upon that hill there are now going up two buildings, one to be the hospital for women and the other for men; and from that city has come many times within the last few years the urgent plea that I go out there and be one of the physicians in that city where they know nothing of hygiene, nothing of surgery, nothing of asepsis, nothing of the great remedies which we have to alleviate pain; nothing but squalor, sin, weakness, sickness, uncleanliness. Nothing but common duty urges me to go out there.

"And the third reason why I go is because of the unique, unmeasured privilege. The grandest moment in my life will be when I stand with my colleagues on that hospital ground and the gates are flung open with the news that the hospital is completed, and the invitation goes out to that city: 'Come in.' I met, some time ago, a Chinese who told me of the necessity of having a Chinese name, and I said, 'Would you christen me?' He wrote out a name in Chinese and I said, 'What does it mean?' He replied with this translation of it, 'American physician, willing to help.' I hope to go out

UNION MEDICAL COLLEGE HOSPITAL, TSI NAN FU, CHINA

some day as Chen-chou Fu and be an American physician willing to help. I hope to see some day, under the touch of the knife, in the dispensary, at the bedside, the play of the masterful forces of Jesus Christ, as through sympathy and tenderness and unselfish service, his own life may strike deep into the lives of these who know him not. God is going up and down in this great concourse of students, laying his hand upon man after man, medical student after medical student, calling him to be great enough and big enough and loyal enough to go out into this staggering, sorrowing, struggling world and be to it what Christ was, to pity it as Christ pitied it, to love it as Christ loved it, and to serve it with his own sacrificial heart. God calls with loving patience for men to lay their lives alongside of the tremendous immeasurable needs of the non-Christian countries, and to solve the awful problem of human suffering; and as I shall set sail in a little while for that great Empire of China, I want to carry with me from this hour the conviction that the men here are going to enter into a solemn compact with me to devote their lives, especially the medical students, to the solving of the problem of human suffering in the non-Christian world."

The members of the Catholic brotherhoods and sisterhoods also support movements of this kind in all parts of the world.

MEDICAL MISSIONARIES OF PROTESTANT CHURCHES.

	Men.	Women.	Hospitals.	Dispensaries.	Countries.
Seventh Day Adventist	17	7	4	8	Africa, Asia, South America.
American Baptist	55	18	19	33	Philippines, Congo, Burma, China, South India, Assam, Bengal.
Seventh Day Baptist		2		1	China, India, Africa.
Southern Baptist	12	2	6	13	China, Japan, Africa, Mexico, South America.
American Board	25	12	28	40	Africa, India, China, Philippines, Turkey, Japan, Ceylon.
Christian Women's Board		4	5	7	Africa, India, West Indies, Mexico, New Zealand.
Foreign Christian Missionary Society	16		25		China, Tibet, Philippines, Africa, Japan.
Evangelical	3		1	2	China, Japan.
American Friends	3	5	2	2	Alaska, India, Mexico, China, Africa.
Lutheran	9	5	6	15	India, Japan, China, Africa, Madagascar.
American Mennonites	3		1	3	India.
Methodist	40	41	45	36	China, India, Japan, Korea, Africa, Philippines.
Presbyterian	102	38	80	119	India, Mexico, Sudan, China, Persia, Siam, Japan, Philippines, Africa, Korea, Cuba, Syria, Brazil, Cyprus, Asia Minor.
Protestant Episcopal	14		7	11	Africa, China, Japan, Cuba, Brazil.
Reformed Church	13	7	13	9	Japan, China, India.
United Brethren	2	1		7	China, Japan, Africa.

CHAPTER XXI.

Corporation Service.

Railway Service.

Every one of the railway organizations has its own surgical staff, consisting of a chief surgeon and local assistant surgeons.

The chief surgeon's duties are to pass upon all examinations of employees wishing to enter the railway service; to direct the sanitation of the road, disinfect coaches, supervise the drinking water supply, to appoint and dismiss local assistant surgeons, and see to the efficiency of the medical service of the road. He passes upon the applications for pension of disabled employees, he assists or advises the legal department in all cases of a medico-legal aspect, such as damage suits for injuries sustained by employees, or others, on the railroad property. This latter function is a very important one, as thousands of claims for damages are filed against railroad corporations by persons whose claims are based upon injuries received on railroad property. The chief surgeon in these cases must have physical examinations made of the victim, in order to determine the extent of permanent disability and to be able to advise the legal department.

The chief surgeon directs the treatment of cases of injury, he instructs the local surgeons how to proceed in emergency work, and in rendering first aid. One must

remember that these railroad surgeons do not only render first aid to the injured employees of the system, but also to those of the traveling public who receive injury in railroad accidents.

On one of the western railroad systems there is a hospital system organized jointly by the corporation and employees. It is very necessary where there are great distances between large cities. The railway company pays for the care of the injured, and for the employees by assessments; in this way sufficient hospital facilities are maintained in sparsely settled communities, providing competent medical service for employees and the traveling public.

The salaries of the chief surgeons run from $2,500 to $6,000, depending somewhat upon the amount of work, and whether part or whole time is taken up by official duties.

The local railway surgeons who are stationed at all important points, one or more in practically every county, are on the fee-bill basis, and receive payment according to the rates prevailing in their locality. Others in division points are on a straight salary, subject to call of the local railway officials. In nearly all cases the local surgeon gets free transportation for himself and family, over the lines of the company; and some companies extend this, upon special application, to foreign roads.

The duties of the local surgeons are outlined in the general instructions, and if the case demands special instructions, these are given by the chief or division surgeon.

The railway service should not be considered as a field in itself offering sufficient remuneration for a young

man, because no young man can obtain the appointment as chief surgeon. A chief surgeon must be an older, experienced, responsible man. The local appointments, with few exceptions, do not pay enough for full-time work. The work is ideal, though, as a side line to a general practice. Many opportunities arise for one to demonstrate his skill and aptitude in surgery. This work will, besides offering good experience with small compensation, help him to establish himself in private work. The very fact that one is employed by the railway corporation as a surgeon gives him prestige.

Transatlantic steamships also have medical men on their regular staffs. These positions are not unlike the positions which are offered by hospitals to young graduates of medical colleges. The men receive, in addition to their maintenance, small salaries.

The life-insurance business has developed by leaps and bounds within the last twenty years, and all companies must depend upon physicians for the examination of their risks. In each community where a life-insurance company does business, it has a medical examiner. Each company employs its own, and in some communities nearly all physicians are examiners for one or more insurance companies. Other communities have one or two physicians who do all the examining.

These appointments in themselves are not sufficiently remunerative to be depended on for an income, but they give one prestige and an opportunity for acquaintance that helps in building up a private practice.

Then there are examinations to be made for the fraternal insurance associations, as for the Modern Woodmen, The Foresters, The Red Men, The Knights of

Pythias, etc. These examinations are usually made by physicians who are members of the orders.

The fees for old-line life-insurance examination are from $3 to $5; for fraternal or assessment orders, from $1 to $2.

The passage of workingmen's compensation laws, under which employers are compelled to pay directly or indirectly for the accident insurance risks of their working men, makes it necessary for practically all manufacturing corporations to retain the service of a physician, who serves them much in the same way as the doctors serve the railroads.

Many large corporations employ physicians on full time, and this opens a field which young men may well consider. It must be remembered that there are many commercial organizations and industrial concerns which employ a thousand or more people whose efficiency is determined by their physical condition. The managers of these corporations are organizing medical departments for the service not only of the employees, but also of their families very much after the plans of the medical departments of the army posts. This field should prove attractive to the young medical graduate. For winning the highest success he should be informed on the methods of welfare work in all of its various aims.

CHAPTER XXII.

The Red Cross.

It was Jean Henri Dunant who after witnessing the apparently unnecessary suffering of the wounded on the battle field made such an effective appeal as to lead to the organization of an international association for relief with branches in all civilized countries. The banner of the organization was a red cross on a white field. In 1881 the American Red Cross was organized with Miss Clara Barton as its president. For twenty-four years the organization has held itself in readiness to assist in relief measures in every kind of calamity, whether war, or fire, or flood, earthquake or epidemic. In 1905 a reorganization was effected and governmental support was accorded to the American society. Its activities are carried on through many subdivisions of the association. We are here concerned only with the medical service. This service supplements the work of the army medical service and the federal health service.

The Red Cross base hospital unit is composed of 22 physicians, 2 dentists, 50 nurses, 25 volunteer nurses' aids, and 15 civil employes. The base hospitals are under the direction of some parent institution, that is the staff officers of some hospital who select the physicians and nurses for this work. During times of peace there is no remuneration to the members of these units, but during times of war they are mustered into service and given commissions and pay according to their re-

spective positions, as colonels, majors, captains or lieutenants. Three months after the country entered the European war forty-one of these base hospitals were organized and ready for service. It costs about $75,000 to equip one of these hospitals. The experience which these base hospitals afford is not unlike that which is obtained in the army medical service but those engaged in the Red Cross work are not exposed to the hazards of those in service on the front battle lines. The hospitals are usually located in the rear of the fighting lines. The buildings are of more or less permanent kind and the quarters of the officers are usually comfortable. When these units are mustered into military service, all of the officers, of course, come under military discipline. From the officers in these base hospitals special teams are organized for emergency service in the field.

Ninety days after diplomatic relations with Germany were severed, forty-two ambulance companies were organized by the Red Cross for service in the field and the number of these organizations is being extended as rapidly as funds become available. These ambulance units form relief divisions ready for emergency service on the firing line or in the thickest of the battle to render first aid service to the injured. Each unit is composed of a director, three surgeons, one head nurse, six assistants and a clerk. These units are expected to respond to any emergency calls and their work is most hazardous and strenuous. No more brilliant exploits of daring are recorded in history than those which have been performed by the Red Cross ambulance corps in our recent wars.

It is true that by the Geneva Convention all the signatory powers agreed that in times of war the work

Underwood & Underwood

American Red Cross Hospital Unit

of the Red Cross should be accorded full protection by the armies of belligerents but with the introduction of long range guns it is practically impossible for the artillery men to distinguish between those who are performing these missions of mercy and their enemies and these guarantees of protections come to mean less and less. The expenditures for service in European battle-fields for 1917 will exceed ten millions for the American Red Cross alone.

The permanent office of the American Red Cross at Washington is rendering a great national service in having its enrolled lists of men who are ready to undertake any kind of emergency service which may be called for by any great calamity. Upon short notice they were able to have ready for service in times of such great floods as swept through the Miami Valley and the destruction of San Francisco their enrolled volunteers from near by localities.

CHAPTER XXIII.

Research Work.

Dr. Robert T. Morris has recently expressed the opinion that the future advances in medicine will be made by the men who work on salaries and give their undivided time and energy to investigation; that so many factors are involved in physiological processes, the process of elimination is so slow, and the continual, patient, watchful attention so necessary, that only the man who devotes his whole energy and time to a subject can hope to master the field of related knowledge sufficiently well to extend our conquests into disputed or little-known areas.

This has recently been recognized, in the wide acceptance of the recommendations of medical councils that the professors in medical colleges should be paid salaries sufficiently large so that it would not be necessary for them to combine teaching and practice; that the demands of their professorial duties should be so limited that they could command the time for study in their several special fields; and that the laboratory and library equipments of the acceptable medical college should be increased far beyond what is found at present in the average institution.

The necessity for setting aside certain men to give their time to the investigation of special problems has also been recognized in the public health service and by the establishment of the Rockefeller Institute at Sixty-

sixth St. and Avenue A, in New York city, which, with its munificent endowment of $4,000,000, is exclusively devoted to medical research.

Progress has at best been slow when made by men burdened with regular daily tasks, using their odd hours, working in poorly equipped laboratories, with an inadequate command of the existing field of knowledge in the departments in which they were experimenting.

In previous chapters, reference has been made to the investigation into the causes of yellow fever and other destructive scourges. Physicians daily meet with equally destructive influences, of whose control they are ignorant.

Of late years, the disease known as infantile paralysis has become epidemic in various parts of the country; even adults have developed the disease in fatal forms. Many who have recovered are partially paralyzed, some permanently. The medical fraternity has been aroused; men are seeking for the causes of the disease, for the mode of its dissemination, and the possible methods of control.

In 1909, Landsteiner and Popper produced the disease in monkeys by inoculation, thus proving that the disease could be communicated. Dr. Flexner of the Rockefeller Institute proved that it could be transmitted from monkey to monkey, showing that it was due to an organism that could not only be developed in a living being but transplanted from one to another. While the infectious material could not be isolated, it was found that it could be transmitted; that some animals were immune to it. There is a call for some devoted soul to expose himself while he engages in the search for the

disturbing cause and if he succeeds to enroll his name on the world's list of immortals.

Dr. Alexis Carrell, of the Rockefeller Institute, received the Nobel prize for his discovery that blood vessels could be transplanted and sutured, that sections of veins could be inserted into arteries, that they will heal and function in spite of the fact that the arterial coats are much stronger and firmer than those of the veins. He demonstrated the practical value of his discovery by joining the radial artery of a father's arm to the vein of a five day old child, thus saving the life of the latter through a transfusion of blood.

By this discovery the old and cumbersome methods of transfusion of blood were displaced. Before these successful experiments, preceded by a long series on lower animals, no surgeon would have sutured these blood vessels together, because of the possible fatal introduction of blood clots into the circulation.

The wonderful possibilities suggested by the experiments of Professor Metchnikof, in proving that many of the fatal poisons which shorten human life are generated in the body by the action of bacteria which can be destroyed through the introduction of other bacteria, have opened up a new and very fascinating field of experiment, through the mastery of which competent authorities have predicted that human life can be indefinitely prolonged.

Just enough is at present known about biochemistry to suggest the possibility of the accurate regulation and control of the chemical composition of fluids of the body, in such a way that methods may be devised as revolutionary as those which have followed the discovery of the properties of radium and the X-ray.

Main Building

Rockefeller Institute of Medical Research,

New York

The progress in physics has suggested the possibility of saving by cold storage processes the healthy organs of persons who have met violent deaths, for transplanting in place of diseased organs in living persons.

In the field of sanitation, it has been proved that, at an expense of less than $3 per year per inhabitant, it is possible to make the miasmatic regions of the Canal Zone as safe as the most carefully guarded city; and since the methods for doing this work have been so worked out that they may be adapted to any locality, one ceases to wonder why liberal men should be ready to give large means, and why men of strong intellects should be attracted to the narrow confines of the laboratory, to devote promising lives to patient study and investigation. It is needless to say that those who are selected to do this work must be men of demonstrated intellectual ability with a capacity for work, and with such a devotion to humanity that they will find their reward in their work, rather than in the monetary returns which these positions pay. One of these will discover the real cause of cancer, and develop a cure for it; another will place himself alongside of Jenner by leading the world to a mastery of tuberculosis; and through the labors of others, one after another of the enemies of humanity which have heretofore baffled science will be controlled.

CHAPTER XXIV.

Commerce and Medicine.

Closely related to the work of the research men in medicine is the work of the preparation and distribution of the curative and remedial agents, whose virtues have been discovered in the research laboratories and tried out in the dispensaries and the hospitals, and the manufacture and sale of medical supplies. After Jenner had discovered his treatment for smallpox, through the careless handling of vaccine the treatment was used with only partial success, thus arousing prejudice against it and hindering its use for many years. This has been changed, and the laboratories which supply vaccines, antitoxins, bacterins and tuberculins are now supervised by trained experts.

Not less than forty biological products are used in medicine today, and each is prepared according to its own special methods. The important factor in the preparation of these products is the maintenance of absolute purity and standard of immunizing power, so that the physician may inoculate the patient without any danger of implanting in him the germs of some other disease.

There are in this country today twenty-five of these commercial biological laboratories, all of which are regularly inspected by officers of the federal government.

In the preparation of the antitoxin for diphtheria, young healthy horses are rendered immune to the poison. The toxin is obtained by the development of a virulent

culture of the diphtheria bacilli upon the surface of beef bouillon in a flask at a uniform temperature of 65 degrees Fahr. for one week. The culture is then treated with a 5 per cent. solution of carbolic acid, and after standing for forty-eight hours the solution is filtered. A one-hundredth cubic centimeter is then injected into a 250-gram guinea pig, and if it kills the animal within four days it is considered strong enough to try on the horse. The horse is given an amount of the toxin which would be considered necessary to kill 5,000 guinea pigs of the former weight. At the same time he also receives an injection of 10,000 units of diphtheria antitoxin. This process is repeated with larger doses of the poison, and in three or four days a repetition of the doses of both the toxin and the antitoxin. After this the animal receives, every five days, an injection of the toxin only, and so the conflict between the virulent germs and their enemies is waged in the circulatory system of the animal for about six weeks; after which a little blood serum is withdrawn and its resisting power is tested. If its power is high the horse is bled to death under strict conditions of cleanliness, the blood serum is concentrated, refined, standardized and put into carefully sealed packages for the market.

It is needless to say that great care must be exercised to see that the animals are sound and healthy, that the stables and surroundings are sanitary and that the laboratories and appliances and all the attendants are clean according to the scientific definitions of cleanliness.

Many men who find, after completing their medical course, that they are lacking in some of the qualities which are needful for success in practice, and that they do not possess the imagination nor the initiative for

success in independent research, may find profitable uses for their training in this interesting and highly important work. The workers in this field are not called upon to submit to the irregular demands which are made upon the time and the energies of a practitioner, yet the work is not without its dangers of infection while handling various kinds of bacteria. The salaries range from $1,000 to $2,500.

The superintendents of the laboratories which prepare for the trade the pills, powders and tinctures in endless forms and varieties are rather pharmacists and chemists than physicians, and the manufacturers of surgical appliances and supplies are for the most part men who have had a training for business rather than for a profession; but many men of medical education are employed as salesmen to introduce, among physicians, these commercial products.

Not a few physicians in the past, not content with the slow returns from an ethical practice, have thrown their ethical codes to the winds and embarked upon the manufacture and sales of so called patent medicines. In one of our cities this business has developed to large proportions and, according to the reports made to the commercial bureaus, the managers of the houses in this line of business, after deducting their raw materials, salaries and wages and other expenses from the factory value of their manufactured product, had left, in 1909, 198 per cent. on their capital invested. In recent years, on account of the rigid supervision, and the refusal of their advertisements by newspapers, there has been some decline in this business. In few of these concerns which were examined did any of the employees receive more than a living salary. It is a mistake for one com-

Anti-Toxin Testing Laboratory

Inoculating a Horse

mercially inclined to enter medicine with the desire to "get-rich-quick" through quackery. There are so many respectable commercial enterprises that should appeal to such, rather than this questionable trafficking in human lives.

Biological Laboratories.

The following biological laboratories were licensed (1916) by the Treasury Department of the federal government to manufacture vaccines, serums, toxins, antitoxins, bacterins, etc.: The Cutter Laboratories, Berkeley, California; Hygienic Laboratories, State Board of Health, California; American Biological Co., Washington, D. C.; National Vaccine and Antitoxin Institute, Washington, D. C.; Memorial Institute, Chicago; The Abbott Laboratories, Abbott Alkaloidal Co., Chicago; Eli Lilly & Co., Indianapolis; Swan Myers Co., Indianapolis; Dr. W. T. McDougall, Kansas City, Kansas; Greeley Laboratories, Boston; Stafford Biological Laboratories, Detroit; Dr. G. H. Sherman, Detroit; Parke, Davis & Co., Detroit; The Upjohn Co., Kalamazoo, Michigan; St. Louis Pasteur Institute, St. Louis, Missouri; Laboratory of Clinical Pathology, Kansas City, Missouri; Bactero-Therapeutic Laboratories, Asheville, North Carolina; E. R. Squibbs & Sons, Research & Biological Laboratories, New Brunswick, New Jersey; New York Pasteur Institute, New York City; Lederle Antitoxin Laboratories, Pearl River, New York; Laboratories of Dept. of Health, New York City; Dr. James McI. Phillips, Columbus, Ohio; Dr. H. M. Alexander & Co., Marietta, Pennsylvania; H. K. Mulford Co., Philadelphia, Pa.; The Slee Laboratories, Swiftwater, Pa.

CHAPTER XXV.

Specialism.

One often hears the school boy say that he is going to be an expert surgeon in response to the question as to what he intends to make of himself. This is really a commendable ambition, but little does the average boy realize what it takes to make his dream come true. To be an expert in any of the special fields of medicine means years of work of preparation and practice. The impression prevails among many prospective students that the only requirement to become a specialist is to comply with the accepted curriculum of a regular medical college, and subsequently to add a postgraduate year in the specialty desired. This impression is erroneous. To become a specialist in medicine one must have a wide experience in a general practice of medicine. He must have a grasp of the whole category of disease, and the effect of disease on the whole body of man, before he is able to analyze in detail the cause of disease of special organs.

A young graduate who, during his college years, paid especial attention to the eye, called upon his professor, one of the best eye specialists in Philadelphia, and asked him what more he should do to become an eye specialist. The professor told him to go out into general practice for ten years, and then if still ambitious to become an eye specialist, to take a postgraduate course in one of the ophthalmic hospitals in America or in Europe, or in both. This advice was sound.

It takes practice to give experience, and in order to develop a sound, broad vision of disease and men, one must be in general practice for a number of years. It is true that there are many practicing surgery who have not had such experience, and yet perform some very brilliant operations. They have the technic, the dexterity, but not the judgment.

The real surgeon is not the one who is skilful with the knife, alone, but one who is able to decide when not to operate as well as when and how to operate. A first-class surgeon always endeavors to avoid operations. When unavoidable, he operates expeditiously. Unfortunately, there are many so-called surgeons who have commercialized the profession, who operate in order to get large fees, regardless of the requirements of the case. Many persons have been subjected to major operations who would have been better off without the operation. This is explained partly because today for conservative medical treatment the fees are comparatively small, while for surgery the fees are large.

The public sentiment is at the present time swinging backward toward conservatism, while a few years ago many who were in apparent health applied to the surgeon to be operated upon. Even today the same condition prevails in regard to the tonsil. The faddist has overeducated the public. Many people look upon the scar resulting from a surgical operation with the same degree of pride as the Heidelberg student regards the scar received in an encounter with his fellows.

The surgeon is entitled to good fees and should receive them for legitimate operations, but at no time should he commercialize his profession. No young man

who is attracted to surgery by the pecuniary rewards should become a surgeon.

Fees are regulated in many respects as are lawyers' fees. They are based upon the risk at stake, the circumstances of the patient, the geographical location, and the reputation of the operator. It is nothing unusual for operators in New York to receive $2,000 for an appendicitis operation, yet other skilful surgeons perform the same operation for $250.

The eye specialist is an eye surgeon, and performs all the various surgeries of the eye and its appendages. He, too, collects good fees, especially for the surgery work. The fees for cataract operations run from $100 to $1,000; for enucleation from $50 to $500; for ordinary office consultations and examinations, from $2 to $25.

The eye specialist, designated as an oculist, is one who treats diseases of the eye and advises the family physician in the treatment of constitutional diseases which are responsible for the eye manifestation. Frequently the optician, who fits glasses only, is confused in the minds of people with the oculist. The optician, or optometrist, as he is called in some localities, may fit glasses, but not treat diseases of the eye, nor operate upon the eye; while the oculist may do whatever is necessary.

The ear specialist is to a great degree a special surgeon. The largest portion of his work is surgical, and very delicate. The mastoid and labyrinth operations are of the most serious nature, and unless the operator is thoroughly familiar with the anatomy of the ear and adjacent structures, much harm can result. The fees are large.

One may wonder how fields as restricted as ear or eye practice could demand much study. The ear is small and the student may think there is but little to know about it; but volumes and volumes have been written upon it alone, and while the middle and internal ears are located deep within the bony walls of the skull, there is no part of the human organism as thoroughly understood as the ear in its structure, function and treatment. The examination and function tests are so scientific that very seldom is an ear specialist mistaken in his diagnosis.

The nose specialist treats diseases of the nose and accessory sinuses. The discoveries in medicine in the last few years lead to the fact that much of the general ill health is traceable to infection in these bony cavities of the face. This makes the nose specialist an important factor in medicine. The larger part of the work may be considered as surgical and the fees are proportionately large. Many specialists combine nose, throat and ear practice. The close relationship between throat, ears and nose makes it necessary for each ear specialist to know all about the nose and throat. Many cases of ear troubles are traceable to diseased conditions of the nose.

One of the fields in surgery, whose importance has only of late years become appreciated as it should be, is the field of orthopedic surgery. One needs only to visit an orthopedic ward in any of the large hospitals and see the various appliances, casts, splints, plasters, braces and exercising appliances used for the relief of the unfortunate little ones, and then watch the entrance of the surgeon into the ward to see the radiant smiles of the children who idolize the man who is exercising his skill in his efforts to relieve them. It is wonderful how appreciative the patients are. While it is a fact that many of

these patients are poor and the returns from a financial point of view are not as large as those from other surgical work, yet there is no field of medicine in which the kind, patient, gentle touch of the physician commands such lasting gratitude of society as in orthopedic surgery. So far, in this country, in many localities this work is attended to by general practitioners or general surgeons who are often incompetent and cannot render the best service to the patient. The treatment of deformities is peculiarly a work for the specialist because no two cases are similar. The specialist must be a skilful physician, mechanic and surgeon. Much of the work is mechanical adjustment, and each case must be treated individually; the appliances must be changed a little here and there from time to time, and braces must be devised to suit each case.

Some physicians make children's disease a special practice. One's practice cannot be restricted to the treatment of children exclusively, except in few instances in larger cities; even then it must be as a consultant to general practitioners. The treatment of children's diseases is very similar to the work with adults, because the diseases as a rule are the same as those of adults. So this work is usually taken up by general practitioners who give especial attention to children in connection with their general practice.

The specialist's practice consists more of consultation work with other physicians than of dealing directly with the public. To command a lucrative special practice one must be able to meet colleagues diplomatically; to differ, if need be, with the diagnosis of the family physician without disturbing the confidence of the family in their physician; to be thorough, competent, conservative

and polite. He should not resort to rebating or to the granting of a percentage of his fees to the family physician who recommends him. These practices are sometimes resorted to by unscrupulous specialists. The practice is vicious because, under such conditions, many physicians recommend specialists, not the most skilful, but from whom they get the largest commission. There are also men who advertise in the daily press as specialists offering free consultations and a guarantee cure. No one should consider such a commercialized practice for a moment in choosing a vocation. It is not considered an honorable practice and should be discouraged. The guarantee cannot be enforced if the cure is not made. The money paid cannot be recovered legally on account of so many elements that can enter into a case which cannot be controlled.

CHAPTER XXVI.

Women in Medicine.

This is not the place to determine the merits of the arguments on the two sides of the debate between the feminist who claims the whole field of medicine for women by right of prior occupation and natural adaptation; and the crusty old specialist who says that the prejudice against women in medicine is probably primal in its origin, and the more generous man who says that women have not been so successful in medicine as they have deserved, because other women do not have a sufficient degree of confidence in them.

Both sides could prove their contentions by quoting these figures from the last census, which show for the entire country.

	Male.	Female.
Physicians and surgeons	142,116	9,015
Trained nurses	5,819	76,508
Nurses not trained	15,926	110,912
Total	166,023	207,312

In 1900, women comprised 5 per cent. of the whole number of physicians and surgeons, and in 1910, 6 per cent., while the great army of women in the field of trained nursing is almost entirely a development of the twentieth century. It is evident that women are doing their part in caring for the sick and unfortunate. On the other hand it appears that, in the field of medicine

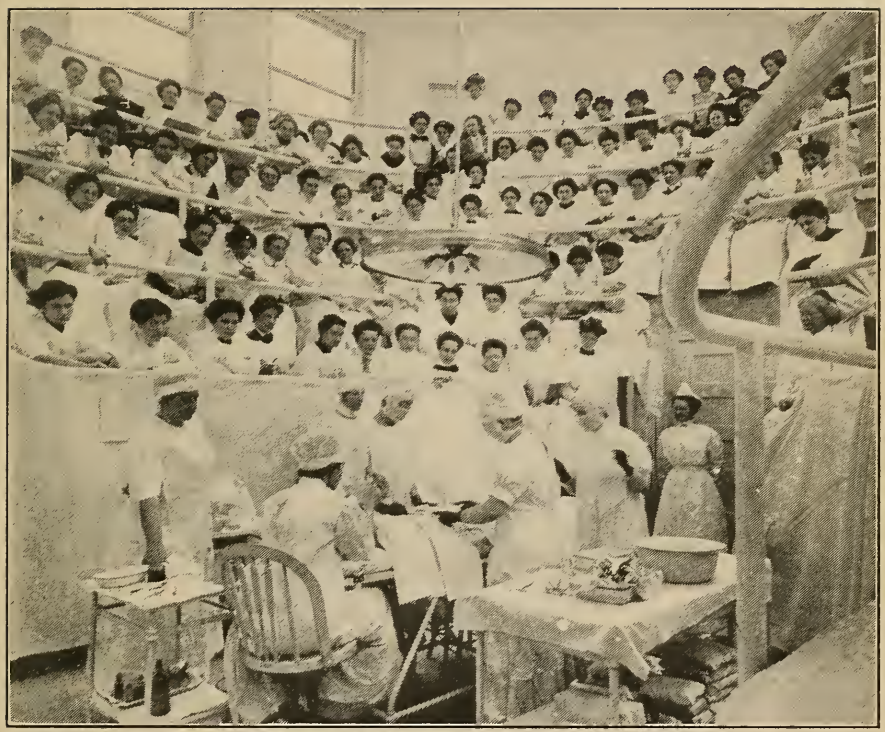


Photo by H. D. Jones from Underwood & Underwood, N. Y.

DEMONSTRATION BEFORE STUDENTS
Women's Medical College of Pennsylvania

proper, the number of women students enrolled in the medical colleges in 1904 was 4.3 per cent., and in 1914, 3.8 per cent., of all the students enrolled; and the number of female graduates in medicine was 4 per cent. of the entire number of graduates in 1904, and 3.4 per cent. in 1914. The number of female medical students in attendance upon the medical colleges was 1,129 in 1904 and only 631 in 1914. Of these only about 20 per cent. were in attendance at the two women's medical colleges, while the larger number attended coëducational institutions.

An expert in medical education, commenting upon these figures, says: "Now that women are freely admitted to the medical profession, it is clear that they show a decreasing inclination to enter it. More schools are open to them; fewer attend and fewer graduate. True enough, medical schools generally have shrunk; but as the opportunities for women have increased, not decreased, within a year during which entrance requirements have, so far as they are concerned, not materially altered, their enrollment should have been augmented, if there were any strong demand for women physicians or any strong ungratified desire on the part of women to enter the profession. One or the other of these conditions is lacking, perhaps both."

The president of one of the state medical associations, upon being interviewed, summed up the whole matter somewhat as follows:

"There are fields of medicine for which women are peculiarly adapted; the foreign mission field, the school inspection service, especially where the work is with girls, the examination of women factory employees, the personal and social hygiene service of public health

work, and the examination of women applicants for life insurance and in the health service of the industrial life-insurance companies. There is no reason why women should not succeed as specialists in the treatment of the eye, ear and nose, in children's disease, and bacteriological and biological laboratory work.

"There is an unlimited field in China and India for women physicians who have been trained in western methods. The customs of the countries have established rules whose violation is not excused by even the most extreme forms of suffering. Not only is the progress of the medical missions hindered by this lack of women physicians, but it is gradually becoming possible for them to establish themselves in other connections and with other associations.

"In the treatment of diseases peculiar to women female practitioners have established lucrative practices. Few persons realize the extent to which cancer of the female reproductive organs prevails. The early symptoms are of such an intimate nature that women will not discuss them with a male physician. With the advent of the female physician, these early symptoms will be more likely to receive proper treatment.

"The treatment of nervous disorders which are so often to be traced to discordant, uncongenial and incompatible social relations, the handling of cases of houses of refuge for wayward women, and the work with women in asylums and hospitals, should make a special appeal to women who are seeking a life career.

"As preventative medicine becomes more and more emphasized, and the great value of personal hygiene and domestic sanitation becomes more fully recognized, there will be a demand for a much larger number of

women to conduct campaigns of education under the auspices of the public health authorities in congested quarters of our cities and in rural communities.

"With the inauguration of efficiency campaigns and welfare work by corporations, there will be an increased demand for women with medical training to direct this work for the concerns which employ large numbers of women and girls. Ex-president Roosevelt, in commenting upon a section of the factory laws providing for the physical examination of employees, was one of the first to call attention to the need for women to conduct these examinations of female workers.

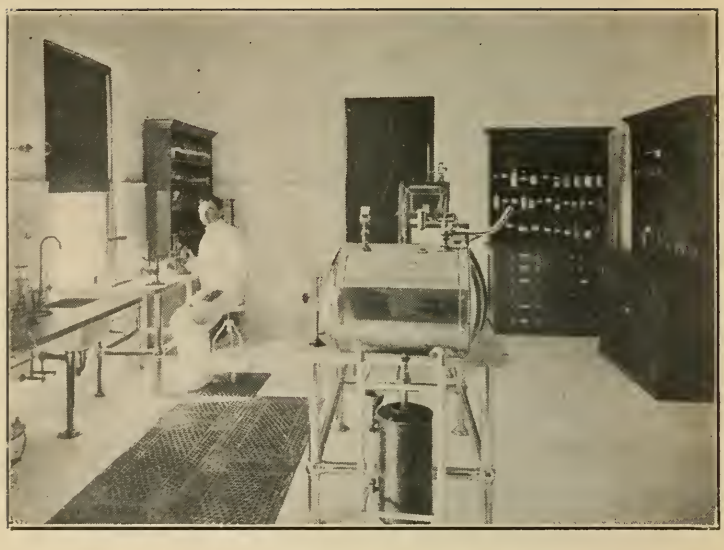
"Historically speaking, we may say that it has only been in this country, and during a comparative short space of years, that it has become the accepted custom to call in male physicians in confinement cases, and it seems that women are again entering upon this work, by nature their own.

"In surgery there are many women who have demonstrated their success in major operations. In the hospital connected with the colleges for women, very skilful operations are performed. In the New York hospital, operations for appendicitis have been performed in twelve minutes. One may enter this operating room and observe the surgeons with their heads, nose and lower parts of the face covered, with their operating gowns reaching to their feet, as is customary in all hospitals, without any thought that anything out of the ordinary is going on. If there is any difference it is to be noted that perhaps they are more conservative than men; and those familiar with the healing art recognize that in surgery conservatism is a virtue, not a fault."

In preceding chapters, reference has been made to the work which women are doing in medical laboratories.

The natural conservatism of women may explain why larger numbers have not entered this field. The woman who must plan for herself a wage-earning career cannot often command the funds to make the outlay which preparation for medicine demands; nor is she often in a position to regard with equanimity the long years of unremunerative work. Furthermore, on account of the comparative small number of female candidates who apply to the hospital for service, it has been difficult to persuade the hospital authorities to mke those changes which are necessary to provide for a mixed staff of internes and house physicians.

In conclusion, it may be said that there never was a time when it was so easy for a woman to prepare herself for this field, and when there were fewer obstacles placed in her path.



Laboratory and Operating Room Southern Pacific Hospital, San Francisco

CHAPTER XXVII.

The Future of Medicine.

In these days of rapid changes, a young man does not care to make large investments of time and money in preparing for a life work without considering what changes are likely to occur during his active period of life in the particular field under consideration. Of course all prophecy is but speculation and must be accepted as such; and every man is privileged to indulge his own fancies in this direction.

Through the greater part of the nineteenth century, medical men insisted that the public should regard them as possessing a field of knowledge exclusively their own and that they were endowed with superior wisdom, much of which they tried to conceal in the technical language of the profession; and through the adoption of their own code of ethics they protected the members of their craft from the judgment of the lay public. However, they reserved to themselves the right to determine who should be admitted to their own ranks and under what conditions they should be received. They, however, failed to establish a standard of education by which the general average of practitioners was kept apace with the advances made by their best men. As a result the state stepped in and made laws for the regulation of medicine through the special examining boards which were constituted to determine the qualifications of those who desired to enter the profession.

As knowledge advanced and the social organization became more complex, it became evident that the security of the life of the individual depended as much upon the nature of his environment as upon the knowledge and skill of his medical adviser, and that the physician in his individual capacity could not always control his environment; this led up to movements for the purpose of encouraging preventative medicine, sanitation and such effective organization of medical staffs as to make it possible to bring to bear upon any complicated case or any emergency, either for the benefit of the individual or the protection of the public, the best of specialized skill and the whole of that enormously expanded field of knowledge which has long since outgrown the compass of any one man.

The community for its protection has organized an army and a navy. The members who were serving the community in connection with this branch of the government must be kept in a fit condition, and it was the part of wisdom to establish a medical corps consisting of salaried members. The sufferings of the poor enlisted the sympathies of a prosperous and enlightened people. Relief was organized as a measure of economy, and to minister to the charges of the state another body of salaried physicians was created. Science advanced and systematic sanitary measures became necessary to secure the results of scientific discoveries. Organization became necessary and another body of salaried scientific men, mostly physicians at the outset, was created and thus has the movement grown towards organization for carrying on protective measures on a large scale.

A canvass of the subject in England, before the outbreak of the war, showed that fully one fourth of all the

Barnes Hospital,
St. Louis

Lying-in Hospital,
Chicago

registered physicians were either employed on full-time salaried positions, or else are performing some paid office in connection with their private practice. Reference has already been made to the large expenditures which our states and cities are making for maintaining organized work in this field; and in the absence of definite figures it is safe to say that governmental expenses for public health purposes, sanitary supervision and charitable medical service have doubled within the last ten years. Does this mean the complete socialization of medicine; that every school district in the country shall have its physician to treat all the people free as it has its teacher to instruct their children, at public expenses; and that every city shall have its organized staff of specialists and general practitioners supported at the public expense, in the same way that it supports its specialists for fire protection, police protection and instruction?

On all sides we hear complaints from medical men of the hardships to which they are subjected. There is the burden of carrying with them in the rounds of their general practice the accumulated funds of knowledge, much of which they need only on very rare occasions; there is the isolation which is due to the individual nature of their work; there is the difficulty of keeping up with the latest developments in technical skill; then the business relations between physician and patient and between general practitioner and specialist are far from satisfactory; the separate domains of the public health service and of the private practitioner are but vaguely defined, and the public supervision of private practice is proving to be a source of irritation.

As the medical graduate becomes imbued more and more with the scientific spirit, which ever seeks for re-

sults, little comfort in failure is found in the thought that the traditional methods have been followed in handling a case. There comes dissatisfaction, especially when the physician considers such figures as he receives from the hospitals, which show that the autopsies which are performed on the dead failed to confirm over 70 per cent. of the diagnoses. He is forced to the conclusion that no one man alone can command for the benefit of a patient, in extraordinary cases, the best which the past has accumulated; and there comes to him the possibility of team work, which will lessen his burdens, enlarge his usefulness and increase his efficiency.

Unfortunately medicine does not generally appeal to the young man with a capacity for organization and leadership as do some of the industrial and commercial fields in which the rewards for this kind of endowment are better known and there is little in the studies of the medical course and less in the routine of the practitioner to develop this special capacity.

It is true that the hospitals for treating the poor are so organized in our large cities that the patient who comes to them after he is sick or afflicted is turned over to the one man of the staff who handles a specialty, and who has at his command every facility for handling the case, but as a rule these staff physicians are beginners, who handle this work in a routine way, more as a trade than as a profession. On the other hand, a beginning has been made in the organization of private sanitariums in which there is a staff of high-grade specialists so organized as to bring to bear upon any one case the collective wisdom and skill of the entire body. These, however, reach individuals only during limited periods of the disease and do not succeed in realizing the dreams

of the general practitioner, who is persuaded that his highest effectiveness comes from caring for individuals rather than from treating morbid humanity.

Some day there will arise a genius who will map out for himself a community and go to the members and say that he will organize a staff of highly trained men and place them in an establishment in which they will have at their command the best of equipment and for an annual fee will always have at their service and call this fully organized machinery not only for the treatment of the sick but to counsel and guard against sickness.

As these words are written there comes to hand the record of the work which is done by the University of California. There it has been shown that by charging the students an annual fee of five dollars for medical service the institution can maintain a self-supporting body of salaried high-grade specialists who are at the command of the students at all times for advice, consultation and treatment. At the same time there comes the information that Harvard University, the University of Michigan and the University of Wisconsin have set on foot schemes of similar kinds; and that they are not only placing organized medical faculties at the service of the individual students, but that they are making medical examination, at stated intervals, compulsory.

The unrest in the medical profession, the general dissatisfaction of a lay public which has in recent years become better and better informed of the larger possibilities for a more economical and better medical service, presages a revolution, and the question to be determined is whether that revolution will be worked out by the

profession through organization from within, for the wider service and protection of the public, as the life insurance and fire insurance, the lighting of residences has been brought about by organizations which serve the individual for an annual fee; or whether it will be accomplished by the complete socialization of medicine, so that this service for the entire body of the public will be performed by salaried officials paid out of public funds, in the same way that the public provides the schooling for its children, its police protection, its fire protection, its water supplies and the sewerage of its cities and the lighting of its streets.

Whether the larger service is worked in one way or the other the tendency will likely be to raise the poor practitioner to a higher standard or eliminate him entirely and it will also mean a leveling down by doing away with the large monetary returns to the acknowledged leaders in medicine and surgery, but it will result in increasing the general average of income and satisfactions to the men in the profession. It will conduce to more conservatism, by the destruction of the vicious fee-splitting and commission-paying practices, that are indulged in by the unscrupulous and the self-seeking.

CHAPTER XXVIII.

Medical Laws.

The legislative requirements for the practice of medicine are interpreted for the several states by their respective boards of medical examiners. The standards vary greatly, and while in one state a person may lawfully prescribe for the sick, and operate upon the deformed, across the boundary in an adjoining state such service may be regarded as a misdemeanor. All these boards of examiners, however, require that the applicant for a certificate must be a person of good character, must possess a diploma from a reputable medical college and must pass examinations in anatomy, physiology, pathology, chemistry, hygiene, surgery, obstetrics and gynecology. In some states there are separate boards to examine the graduates in particular systems of medicine, and in states where there is a single board there are usually appointed to this board representatives of the regular, eclectic and homeopathic schools of medicine, and the applicant may request to be examined upon therapeutics and the materia medica by those members who represent his own system or school.

The boards of examiners of particular states usually accept certificates which are issued by other states whose standards of requirements are equal to their own; and by addressing a letter of inquiry to the board of medical examiners at the state capitol, applicants can find out whether, at the time, the certificate of examination which

they hold from any state is honored by another state. Holders of certificates or licenses to practice in one state are generally expected to pay a fee or tax in order to have their licenses validated for other states; but in most of the states there are special regulations which permit physicians licensed by adjoining states to wait upon patients in nearby counties across the state boundaries, and they also concede the right to physicians from other states to act as consultants; and allow the regular appointed officers of the army and navy or of railroads to follow their professional work within states in which they do not hold licenses.

Sections of the medical laws of the state of New York and Pennsylvania are given at some length. The applicant who can meet these requirements can qualify in any state. At the end of the chapter a tabular statement is given of the requirements for all of the states.

In New York the Board of Medical Examiners is constituted by the Regents of the University of the State of New York, which is the name by which the department of education is known, and this university includes all duly organized schools controlled by the educational officers of the state.

No persons shall be licensed to practice who have been convicted of a felony; nor shall any person be licensed after 1891 except in accordance with this law. The regents shall admit to the medical examination any person who pays a fee of $25 and submits evidence verified by oath, and satisfactory to the examiners, that he is more than twenty-one years old, is of good moral character, has had, prior to entrance upon the second year of medical study, the academic education which is prescribed by law, and has studied medicine at a school

which has been duly registered as satisfactory by the Regents and been in attendance at such school for a period covering four different calendar years upon courses covering at least seven months of each year. Evidence of five or more years of reputable practice may be accepted as an equivalent for the requirements of the third or fourth years of the medical courses; and evidence of graduation from a recognized college may be accepted as equivalent to the work of the first of the four years in the medical school.

Applicants to practice osteopathy shall produce evidence that they have studied not less than four years, including courses of not less than seven months each, at a school satisfactory to the Regents. From time to time the board issues circulars of information in which the different schools maintaining satisfactory standards are listed. These circulars can be obtained by addressing the Board of Regents, Albany, N. Y.

The law prescribes that the Board of Medical Examiners shall submit to the Regents for their approval, suitable questions for examinations in anatomy, physiology, hygiene, sanitation, chemistry, surgery, obstetrics, gynecology, pathology, including bacteriology and diagnosis.

Examinations shall be held at four different places in the state, four times annually, and the examination shall be in writing and shall be conducted by examiners appointed by the Regents, who shall deliver the papers to the authorized committees. The papers shall be marked without delay and returned with an official report giving the percentages obtained by each candidate in each subject. A candidate who fails upon the

first examination may have a second trial within six months, without paying an additional fee.

The Commissioner of Education may at his discretion, upon the approval of the Regents, endorse the license or diploma of a physician from another state provided the applicant has met all the preliminary and professional qualifications for earning a license in this state, has been in reputable practice for a period of ten years, and has reached a position of conceded eminence or authority in the profession.

Before beginning to practice, the holder of a license shall have the same registered in the office of the clerk of the county where such practice is to be carried on, producing proper evidence that he is the person to whom the license has been issued and that he has complied with all the requirements of the laws governing the practice of medicine, that no money except the regular fees has been paid for such license, and that he has not been guilty of any fraud or misrepresentation in securing his credentials. He shall receive a certificate of such registration, for which he shall pay a fee of one dollar.

A license to practice medicine may be revoked if it is found that the practitioner has been guilty of any fraud or deceit in securing his credentials; if he is an habitual drunkard or addicted to the use of morphine, opium or cocaine; if he violates any of the laws governing the practice of medicine.

Nothing in the law shall be so construed as to affect commissioned medical officers serving in the army, the navy or the marine hospital service, while so commissioned, or any one while serving on the medical staff of a legally incorporated hospital.

The law of 1912 for the state of Pennsylvania is very similar to the law of New York. The Bureau of Medical Education and Licensure is under the jurisdiction of the Superintendent of Public Instruction. This Bureau prepares annually a list of medical colleges and schools which are satisfactory to the department, and which require of applicants for a medical degree a satisfactory high-school education, together with one or more years of work in chemistry, biology and physics in an approved college, and maintain graded medical and surgical courses of four years, of not less than thirty-two weks each of not less than thirty-five hours of work, in didactic, laboratory and clinical studies.

Applicants for the medical examination must furnish satisfactory proof of being twenty-one years of age, of good moral character, not addicted to the intemperate use of alcoholics or narcotic drugs, and that they have complied with the requirements as to preliminary education and attendance upon a duly authorized and approved medical school, have successfully passed each of the courses prescribed by such school and served as an interne for one year at a hospital having, at least, twenty-five beds for each interne.

The medical examination shall be in writing, but may be supplemented by oral examinations, by laboratory tests or by bedside examinations. The examinations shall be conducted at such times and places as may be designated by the Bureau, and specially qualified assistants may be called in to assist in conducting the examinations.

The subjects of the examination shall include: anatomy, physiology, chemistry as applied to medicine, pathology, bacteriology, symptomatology, diagnosis,

surgery, gynecology and obstetrics. The examination in therapeutics and materia medica is to be conducted by members of the Bureau who are of the same school of medicine as the candidate. The law also provides for partial examinations at the end of the second year of medical study, exempting the applicant who passes any subjects at this examination from further examination upon those subjects at the final examinations.

From a table published in the Journal of the American Medical Association in its annual state board issue it appears that from 1912 to 1916 inclusive 545 of the 4283 graduates who appeared before the state boards for examination failed. During those same years none failed in Idaho, Iowa, Minnesota, Nebraska, New Hampshire, Utah, Vermont, Washington, and Idaho. During the same years, 36 per cent. of the applicants were rejected in Mississippi; 20 per cent. in New York; 20 per cent. in South Carolina; 30 per cent. in Oregon. It appears that in those states reporting large percentages of failures the proportion of failures was greater among the applicants who were graduated from colleges outside of those states than from graduates from colleges in the respective states which seems to indicate that a student is more likely to fulfill all the requirements of a state board in a particular state if he has been graduated from a college located in that state.

The lack of uniformity of standards is also indicated by the variation of the number of failures by the graduates of the same institutions in different years. Of one leading institution 10 per cent. of the graduates were rejected by the state boards in the years from 1912 to 1916 inclusive and only 5 per cent. in the latter year; of another large college 6 per cent. failed in the former

period and none in the latter. For all the colleges the percentage of failures was 20½ per cent. in 1912 as against 15 per cent. in 1916. This improved result undoubtedly indicates that standards are becoming more uniform.

The lack of uniformity of standards has resulted in a movement for the establishment of a federal board for granting licenses which are to be good for the entire country. Such a board has been constituted but at present it has no official status but it is believed that the several state boards will take steps to validate the licenses issued by this national board.

The medical laws do not regulate the conduct of a physician after he secures his license to practice, but if it can be proven that he has failed to exercise due diligence and care in his duties to his patients he may be held for damages for malpractice. While it is difficult for a patient to establish before a court claims for damages, suits of this kind are so injurious to a physician that every precaution must be taken to forestall them. There are insurance companies which undertake for an annual fee to afford to practitioners protection against suits of this kind by supplying to their clients at the expense of the company, attorneys for their defense and by paying damages in cases which result unfavorably to the defendant.

A summary of the medical laws of the several states will be found in the Appendix.

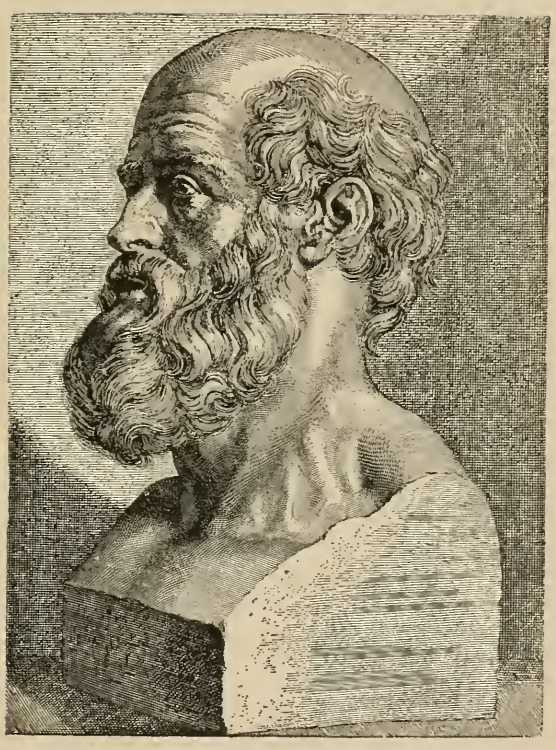
CHAPTER XXIX.

The Code of Medical Ethics.

As a final indication of the peculiar position of the physician we give in this closing chapter a summary of professional ethics as set forth in the Hippocratic Oath, which has been subscribed to by physicians for over two thousand years, and as embodied in one of the several approved modern statements of the code of medical ethics.

The Hippocratic Oath.

I swear by Apollo, the physician, and Æsculapius, and Health and All Heal and all the Gods and Goddesses, that according to my ability and judgment, I will keep this oath and this stipulation; to reckon him who taught me this art equally dear to me as my parents; to share my substance with him and relieve his necessities if required; to look upon his offspring on the same footing as my own brothers and to teach them this art if they shall wish to learn it, without fee or stipulation, and that by precept, lecture, and every other mode of instruction, I will impart a knowledge of the Art to my own sons and those of my teachers, and to disciples bound by a stipulation and oath, according to the law of medicine but to none others; I will follow the system of regimen which according to my ability and judgment, I consider for the benefit of my patients, and abstaining from whatever is deleterious and mischievous,



HIPPOCRATES

The Father of Medicine

I will give no deadly medicine to any one if asked nor suggest any such counsel, but with purity and holiness I will pass my life and practice my art. Into whatever houses I enter I will go into them for the benefit of the sick, and will abstain from every voluntary act of mischief and corruption, and further from the seduction of females or males, of freemen and slaves.

Whatever in connection with my professional practice or not, I see or hear, in the life of men, which ought not be spoken of abroad, I will not dviulge as reckoning that all such should be kept secret.

While I continue to keep this oath unviolated, may it be granted to me to enjoy life and practice of the Art respected by all men in all times. But should I trespass and violate this oath may the reverse be my lot.

A Modern Code of Ethics.

The great principles upon which Medical Ethics are based are these:

The great end and object of the physician's efforts should be "the greatest good to the patient."

The rule of conduct of physician and patient, and of physicians toward each other should be the *Golden Rule:* "As ye would that men should do to you, do ye also to them likewise."

The various articles of the code are only special applications of these great principles.

The physician should hold himself in constant readiness to obey the calls of the sick. He should ever bear in mind the sacred character of his calling and the great responsibility which it involves, and should remember that the comfort, the health and the lives of his patients

depend upon the skill, attention and faithfulness with which he performs his professional duties.

The physician, in order that he may be able to exercise his vocation to the best advantage of the patient, should possess his respect and confidence. These must be acquired and retained by faithful attention to his malady, by indulgent tenderness towards the weakness incident to his condition, and by the exercise of a firm but kindly authority. The physician is bound to keep secret whatever he may either hear or observe, while in the discharge of his professional duties, respecting the private affairs of the patient or his family. And this obligation is not limited to the period during which the physician is in attendance on the patient. The patient should be made to feel that he has, in his physician, a friend who will guard his secrets with scrupulous honor and fidelity.

The physician should visit his patient as often as may be necessary to enable him to acquire and keep a full knowledge of the nature, progress, changes and complications of the disease, and to do for the patient the utmost of good that he is able. But he should carefully avoid making unnecessary visits, lest he render the patient needlessly anxious about his case, or expose himself to the charge of being actuated by mercenary motives.

The physician should not give expression to gloomy forebodings respecting the patient's disease, nor magnify the gravity of the case. Bearing in mind the almost infinite resources of nature, he should be cheerful and hopeful, both in mind and manner. This will enable him the better to exercise his faculties and apply his knowledge for the patient's benefit, and will inspire the

patient with confidence, courage and fortitude, which are the physician's best moral adjutants.

But it is the physician's duty to state the true nature and prospects of the case, from time to time, to some judicious friend or relative of the patient, and to keep this person fully informed of its changes and probable issue; and if the patient himself requests the physician to disclose to him the nature and progress of his disease, it is his duty to state tenderly but frankly the whole truth—provided the patient be of sound mind, and strong enough to receive the disclosure without serious injury. The patient has a right to know the truth. If, moreover, facts within the physician's knowledge lead him to believe that it is of great importance, in relation to the patient's affairs, that he should be warned of the approach of death, it is the physician's duty to reveal to the patient's nearest friend, or to the patient himself, the true state of the case, and the importance of timely action.

Whether the case proceed favorably, or become manifestly incurable, it is the physician's duty to continue his attendance faithfully and conscientiously as long as the patient may desire it. He is not justified in abandoning a case merely because he supposes it incurable.

As the patient has an undoubted right to dismiss his physician for reasons satisfactory to himself, so likewise, the physician may, with equal propriety, decline to attend patients, when his self-respect or dignity seem to him to require this step; as, for example, when he persistently refuses to comply with his directions.

In difficult or protracted cases, consultations are advisable. They tend to increase the knowledge, energy

and confidence of the physician, and to maintain the courage of the patient. The physician should be ready to act upon any desire which the patient may express for a consultation, even though he may not himself feel the need of it. Nothing is so likely to maintain the patient's confidence as alacrity in this respect. Moreover, such a course is but just to him, for he has an indisputable right to whatever aid or counsel he may think likely to be of service to him.

The intimate relations into which the physician is brought with his patient give him opportunity to exercise a powerful moral influence over him. This should always be exerted to turn him from a dangerous or vicious course towards a temperate and virtuous life. The physician is sometimes called to assist in practices of questionable propriety, and even of a criminal character. Among these may be mentioned the pretence of disease, in order to evade services demanded by law, as jury or military duty; the concealment of organic disease or of morbid tendencies, in order to secure favorable rates of life insurance, or for deception of other kinds; and especially the procurement of abortion when not necessary to save the life of the mother. To all such propositions, the physician should present an inflexible opposition. It is his duty, in an authoritative, but friendly manner, to explain and urge the nature, illegality and guilt of the proposed action, and to use every effort to dissuade from it, and to strengthen the patient's virtue and sense of right. The physician should be aware of the frequency of criminal abortion, and of the different methods employed for it, and should take every occasion to warn those who may be tempted to resort to it. In no case should the physician induce

abortion, or premature labor, without a previous consultation with the most experienced practitioners attainable, nor without the most clear and imperative reasons.

Physicians are required, by the nature of their profession, to sacrifice comfort, ease and even health for the sake of their patients. Patients should reflect upon this, and should understand and remember that they have corresponding duties and obligations towards their physicians.

The patient should select a physician in whose knowledge, skill and fidelity he can place implicit confidence; whose habits of life are regular and temperate, and whose character and demeanor are such that he can regard him as a personal friend. He must be able to confide in him freely. And the physician should not be changed for light reasons. A physician thoroughly acquainted with the constitutions, temperaments and tendencies of a family, can the more successfully treat the members.

The patient should always consult his physician as early as possible after he has discovered that he is ill. A disease which is trifling at its onset may grow formidable through neglect. The physician should be regarded as a confidential adviser, who, on being early consulted, may prevent a sickness.

The patient should faithfully and unreservedly state to his physician the cause of his malady, and tell him everything that may have a bearing upon its nature. Since the physician is under the strongest obligations to secrecy, the patients should not allow considerations of delicacy, modesty or pride, to prevent an entirely

frank statement of his case, and candid and full replies to interrogatories.

The patient should implicitly obey his physician's injunctions as regards diet, regimen and medical treatment. If he deviates from these directions, he cannot hold the physician to a full responsibility in the case; and, further, by a partial obedience he incurs some personal risk, since, in the treatment of diseases, all parts of the physician's advice are made to harmonize, and each is dependent on the others and may be unsafe without the coincidence of the others. Moreover, he does the physician an undeserved, and often a serious wrong. If the patient have not sufficient confidence in his physician, and respect for him, to follow his directions, it were better for him frankly to say so, and to employ another in whom he can confide.

The patient should never allow himself, while under a physician's treatment, to take other medicines than those prescribed by him. He would, by so doing, incur a serious risk of taking medicines that are incompatible with each other. If desirous of trying any other mode of treatment, it would be much better frankly to state the fact to his physician and ask his advice.

The patient should, if possible, avoid receiving the friendly visits of a physician other than the one under whose charge he is. When he receives such visits, he should avoid conversation on the subject of his disease; for an accidental observation might give him false impressions respecting his disease, or destroy his confidence in the treatment he is pursuing. He should never send for a consulting physician without the express consent of his own medical attendant; for physicians can act together for the advantage of their patient,

only when they act harmoniously. Nor should he, by a secret appointment, constrain his medical attendant to meet another physician with whom he might not be willing to consult; but the patient has an undoubted right to have the opinion of any physician whom he may desire, upon his case. His proper course is to request his medical attendant to arrange a consultation, and frankly state his desire for the physician whom he may prefer. If his medical attendant decline the consultation, it is then for the patient to determine whether he will insist, and thus dismiss his medical attendant, or whether he will defer to the judgment of his own physician. The patient has a right thus to choose.

If the patient wishes to dismiss his physician, he should, in justice and in common courtesy, state his reasons, and, if possible, in a friendly manner. To dispense with the service of a physician need not, of necessity, change the social relations of the parties.

The patient should, when practicable, send for the physician in the morning, before his usual hour for leaving home. He will, by so doing, secure his earlier attendance, and will enable him the better to apportion his time so as to do justice to all his calls and engagements. He should call on his physician during his office hours only, and should avoid disturbing him in hours devoted to meals, rest and sleep. In receiving his physician's visits, he should avoid compelling him to wait, even a few minutes. The aggregate of petty detentions, while the patient is making some needless preparation to receive the physician, amounts to a serious waste of valuable time.

Inasmuch as every member of the medical profession

partakes of the honor in which it is held, is entitled to its privileges and immunities, and profits by the scientific labors of his predecessors and associates, it is his duty faithfully to endeavor, in his turn, to elevate the position of the profession and, by every honorable exertion, to enrich the science of medicine.

In no other profession should a higher standard of morality and greater purity of personal character be required. Physicians ought to come up to this standard, and do what they may to exalt it. As the practice of medicine requires the constant exercise of a vigorous and clear understanding, and as the practitioner should be, at all times, ready for emergencies in which the welfare and even the life of a fellow creature may depend upon his steady hand, acute eye and unclouded brain, it is incumbent upon the physician to be temperate in all things.

The physician should not resort to public advertisements, or private cards or handbills, inviting the attention of persons affected by particular disease, or publicly offering advice and medicine to the poor, gratis, or promising radical cures. Neither should he publish cases or operations in the daily prints; nor invite laymen to be present at operations, nor solicit or exhibit certificates of skill and success; nor perform any similar act.

It is equally derogatory to professional character for a physician to hold a ~~patient~~ patent for any nostrum or any surgical instrument or appliance; or to keep secret the nature and composition of any medicine used by him. Such restriction or concealment is inconsistent with the beneficence and liberality which should characterize the medical profession. But it is the duty of the physi-

cian to avail himself of every opportunity to observe the action and study the properties of new or secret remedies, and new processes of preparing medicines, as well as new modes of treating diseases, and to subject them to the analysis of scientific investigation. For the physician should always bear in mind that the great object of his profession is to cure the sick, and that it is not only admissible, but is his solemn duty to investigate, thoroughly and without prejudice, whatever offers any probability of adding to his knowledge of the art and means of curing, and of thus enriching the science of medicine.

All practitioners of medicine, their wives, and children while under the parental care, are entitled to the gratuitous services of any one or more of the faculty residing near them. Physicians, when ill, are incompetent to prescribe for themselves. The natural anxiety and solicitude which they feel for members of their own family when ill, tend to obscure their professional judgment and make it difficult to treat them. Under these circumstances, physicians are peculiarly dependent on each other; kind offices and professional aid should always be cheerfully and gratuitously afforded. But visits should not be obtruded, officiously or unasked, upon a sick physician.

If, however, a physician, in affluent circumstances, request the attendance of a distant professional brother, and offer an honorarium, it is not proper to decline it; for one should not, even from a kindly motive, impose upon another a pecuniary obligation, which the recipient would not wish to incur.

If a physician is called from any considerable distance, the expense of travel, etc., thereby incurred,

should always be paid by the physician receiving the visit, and an honorarium may be tendered if much time is consumed in making the visit.

Attention to his personal affairs, the pursuit of health and the various contingencies to which the physician is peculiarly exposed, sometimes compel him temporarily to withdraw from his duties to his patients, and request some of his professional brethren to discharge them for him. Compliance with such a request is an act of courtesy which should always be performed with the utmost consideration for the interests and character of the physician relieved. When this is done for a short period only, all the pecuniary obligations for such services should belong to him. But if a physician neglect his business in quest of amusement and pleasure, he is not entitled to the frequent and long-continued exercise of his fraternal courtesy without conceding to the physician who acts for him the fees accruing from the duties discharged by the latter.

Obstetrical and surgical cases involve unusual fatigue and responsibility; and it is just that the fees accruing therefrom should belong to the physician who attends them.

A complete medical education, of which the diploma of a medical college is the formal voucher, furnishes the only presumptive evidence of professional acquirements and abilities. But the annals of the profession contain the names of some who, not having the advantage of a complete medical education, became, nevertheless, through their own exertions and abilities, brilliant scholars and successful practitioners. A practitioner,

therefore, whatever his credentials may be, who enjoys a good moral and professional standing in the community, should not be excluded from fellowship, nor his aid rejected, when it is desired by the patient in consultation. No difference in views on subjects of medical principles or practice should be allowed to influence a physician against consenting to a consultation with a fellow practitioner. The very object of consultation is to bring together those who may, perhaps, differ in their views of the disease and its appropriate treatment, in the hope that from a comparison of different views may be derived a just estimate of the disease and a successful course of treatment.

No test of orthodoxy in medical practice should be applied to limit the freedom of consultation. Medicine is a progressive science. Its history shows that what is heresy in one century may, and probably will be orthodoxy in the next. No greater misfortune can befall the medical profession than the action of an influential association or academy establishing a creed or standard of orthodoxy or "regularity." It will be fatal to freedom and progress in opinion and practice. On the other hand, nothing will stimulate the healthy growth of the profession, both in scientific strength and in the honorable estimation of the public, as the universal and sincere adoption of a platform which shall recognize and guarantee: a truly fraternal good-will and fellowship among all who devote themselves to the care of the sick; a thorough and complete knowledge, however obtained, of all the direct and collateral branches of medical science—as it exists in all sects and schools of medicine—as the essential qualification of a physician; perfect freedom of opinion and practice, as

the unquestionable prerogative of the practitioner, who is the sole judge of what is the best mode of treatment in each case of sickness entrusted to his care.

The physician may, with propriety, decline to meet a practitioner of whose inimical feelings towards himself, or of whose general unfairness in consultations he is satisfied. But, in such a case, he should explain to the patient his reasons; and if the patient desire the the opinion of the practitioner objected to, the family physician may withdraw from the case and allow the other to be sent for. But, in justice to the latter, the state of affairs should be explained to him at the time he is requested to visit the patient.

The utmost punctuality should be observed in the visits of physicians when they are to hold consultations together; this is generally practicable, for society allows the plea of professional engagements to excuse the neglect of all others, and to be a valid reason for the relinquishment of any present occupation. But, as professional engagements may sometimes interfere and delay one of the parties, the physician who first arrives should wait for his associate a reasonable period of time, after which the consultation should be considered postponed to a new appointment. If it be the attending physician who is present, he will, of course, see the patient and prescribe; but if it be the consulting physician, he should retire without seeing the patient, except in cases of emergency, or when he has been called from a considerable distance, in which case he may examine the patient, and give his opinion in writing and under seal, to be delivered to the attending physician.

In consultations, no rivalry or jealousy should be indulged in. Candor, probity and all due respect should

be exercised towards the physician in charge of the case. If the consulting physician cannot agree with him respecting the nature and proper treatment of the case, the physician should state this fact to the patient, or his nearest friend, both physicians being present at the time, and should request him to select the one in whom he has most confidence. But, if they agree sufficiently to take joint charge of the case, then the consulting physician must justify and uphold, so far as he can conscientiously do so, the practice of his associate, and must abstain from any hints, insinuations or actions which might, in any way, impair the confidence which the patient reposes in him, or affect his reputation. He must refrain from any extraordinary attentions or assiduities, calculated to ingratiate himself in the patient's favor and to supplant his associate.

In consultations, the attending physician should first put the necessary question to the patient. After this, the consulting physician should make such additional inquiries and examinations as may be needed to satisfy him of the true nature of the case. But he should avoid making a parade of examining the patient more thoroughly than had been done before; rather suggesting to the attending physician, where this is possible, to make whatever examinations he desires, than making them himself. Both physicians should then retire to a private room for deliberation.

In consultations, the attending physician should deliver his opinion first; then, where there are several consulting physicians, they should express their opinions in the order in which they have been called in. Should an irreconcilable diversity of opinion occur, when more than two physicians meet in consultation,

the opinion of the majority should be regarded as decisive; but, if the number be equal on each side, the decision should rest with the attending physician. If two physicians, in consultation, cannot agree, they should call in a third to act as umpire. If this is not practicable, the patient must be requested to select the physician in whom he is most willing to confide. The physician who is left in the minority should, without any ill feeling, retire from the consultation, and from any further participation in the management of the case; and, in justice to the physician thus retiring, the fact of his difference from his associates should, in the presence of all the physicians attending, be explained to the patient, as his reason for withdrawing from the case.

The attending physician should communicate to the patient or his friends the directions agreed upon in the consultation, as well as any opinon which it may be thought proper to express. But no statement or discussion should take place before the patient or his friend, except in the presence of all the physicians attending, and by their common consent. And no opinions or prognostications should be delivered, which are not the result of previous deliberation and concurrence. No decision arrived at in a consultation is to be regarded as restraining the attending physician from making such variations in the treatment as any subsequent change in the case may demand. But such variation and the reasons for it ought to be carefully noted at the time, and detailed at the next meeting in consultation. The same privilege belongs also to the consulting physician, if he is sent for in an emergency when the attending physician is out of the way; and similar explanations must be made by him at the next meeting.

Sometimes a special consultation is desirable in cases in which the continued attendance of two physicians might be objectionable to the patient. The consulting physician, in such a case, should sedulously avoid all further unsolicited attendance. Such consultation requires an extraordinary outlay of time and attention, and at least a double honorarium may be reasonably expected.

The consulting physician cannot, with propriety, take exclusive charge, at any time, of the patient in whose case he has been called in consultation, without the consent of the attending physician, except in cases herein provided for.

Medicine is a liberal profession and those admitted into its ranks should base their expectations of success upon the extent of their qualifications, not upon intrigue or artifice. A physician should not allow himself to feel envious or jealous of a brother practitioner. The distinction which one successful physician wins is shared by the whole profession. Nor should a physician suffer himself to feel ill-will towards another who may come into his neighborhood and appear likely to take a share of the business which he has hitherto enjoyed. Such feelings are inconsistent with the beneficent and liberal nature of the profession. Liberality and true generous fraternity in thought, word and deed, will unite the interests of all the members of the profession, and will so exalt the estimation in which it is held in the community that, confidence being increased, business will likewise increase; and to physicians will be accorded the position which, of right, should be theirs; that of confidential family advisers in all matters per-

taining to the care of the body in health, no less than in sickness.

The physician, in his intercourse with a patient who is under the care of another practitioner, should observe the strictest caution and reserve. No meddling questions should be asked in any interview for business or friendship, no disingenuous hints thrown out relating to the nature and treatment of his disorder; nor should the patient be allowed to converse upon these topics. No course of conduct should be pursued which might, directly or indirectly, tend to diminish the trust reposed in the physician employed.

A physician should not take charge of a patient who is, or has recently been, under the charge of another practitioner in the same illness, except in cases of sudden emergency, or in consultation with the physician previously in attendance, or when the latter has relinquished the case, or has been regularly notified that his services are no longer required. Under such circumstances no unjust or illiberal remarks should be made, or insinuations thrown out in relation to the treatment pursued by the previous physician. Nor should the physician permit the patient unreasonably to find fault with his predecessor. For patients often become dissatisfied with their attendant on account of the mere duration of a case which no degree of professional knowledge or skill could have shortened.

In cases of accident or sudden emergency, one or more physicians are often sent for by alarmed friends. Courtesy should assign the patient to the first of these that arrives; and he should select from those present such additional assistance as he may deem necessary. But he should also request the family physician (if

there be one) to be sent for, and, on his arrival, resign the case into his hands. The practitioner of the patient, when he arrives, should take the place of any one called in his absence. "The practitioner of any patient" is the man whom he has in any way given to understand that he regards him as his medical adviser, or who would now be in charge of the case were it not for his absence, sickness or other disability.

In a sparse population, a physician when visiting a sick person may be desired to see, in an emergency, a neighboring patient, who is under the regular charge of another physician. The conduct to be pursued on such an occasion is: to give advice adapted to present circumstances; to interfere as little as possible with the general plan of treatment; to assume no further direction of the case unless it be expressly desired; and, in the latter case, to request an immediate consultation with the practitioner previously employed.

A wealthy physician should not give advice gratis to the affluent; because his so doing is an injury to his professional brethren. The office of the physician can never be supported as an exclusively beneficent one; and it is defrauding, in some degree, the common fund, when fees are dispensed with, which might justly be claimed.

When a physician who has been engaged to attend a case of midwifery is absent and another is sent for, if delivery is accomplished in the absence of the former, the latter is entitled to the fee, but he should resign the patient to the practitioner first engaged.

Diversity of opinion and opposition of interests may, in the medical, as in other professions, sometimes occa-

sion controversy and even contention. When such cases occur and cannot be immediately terminated, they should be referred to the arbitration of a sufficient number of physicians or a court-medical.

Some general rules should be adopted by the physicians in every town or district, relative to pecuniary acknowledgments from patients. These should be adhered to by physicians as uniformly as circumstances will permit. They serve, likewise, as a standard to which appeal may be taken in cases of doubt or dispute.

Members of the medical profession have been so uniformly in the habit of attending, gratuitously, the indigent sick and, in general, of answering every call promptly, and without a question as to whether they are to receive remuneration therefor, that many persons seem to think they have a right to demand the services of physicians; and do, in fact, call upon them freely, and neglect or refuse to render any pecuniary equivalent, although abundantly able to do so. They impose upon one physician, in this way, until they have exhausted his patience, and then call upon another; and thus, in the course of a few years, make the circuit of the profession in their neighborhood. It is proper for the physicians of a community to make a list of the names of such individuals, and to demand, before visiting those whose names are on it, adequate security that their honorarium will be paid.

As good citizens, it is the duty of physicians to be vigilant for the welfare of the community, and to bear their part in sustaining its institutions and burdens. They should be always ready to give counsel to the pub-

lic, in relation to matters appertaining to their profession; as for example, on subjects of medical police, public hygiene and legal medicine. It is their province to enlighten the public in regard to quarantine regulations, the location, arrangement and dietaries of hospitals, asylums, schools, prisons and similar institutions; in relation to the medical police of towns, drainage, ventilation, etc., and in regard to measures for the prevention of epidemic and contagious disease. And, when pestilence prevails, it is their duty to face the danger, and to continue their labors for the alleviation of suffering, and the saving of life, even at the risk of their own lives.

Physicians should always be ready, when called on by the proper authorities, to enlighten coroners' inquests and courts of justice, on matters strictly medical, such as involve questions relating to insanity, legitimacy, or sudden and violent deaths, and in regard to the various other subjects embraced in the science of medical jurisprudence. But, in these cases, and especially where they are required to make post-mortem examination, it is just and right, in consequence of the time, labor and skill required, and the responsibility and risk they incur, that the public should award them more than a mere consulting fee.

There is no profession, by the members of which eleemosynary services are more freely dispensed than they are by physicians; but justice demands that some limits should be placed to the claims upon such offices at their hands. Poverty, professional brotherhood, the benevolent and scantily remunerated occupation of the individual patient, should always be recognized as presenting valid claims for gratuitous services. But neither

institutions endowed by the public or by rich individuals, societies for mutual benefit, for the insurance of lives or for analogous purposes, nor any profession or occupation can be admitted to possess such privilege. Nor can it be justly expected of physicians to furnish certificates of inability to serve on juries, or perform military duty, or to certify to the state of health of parties wishing to insure their lives, obtain pensions or the like, without a pecuniary acknowledgment. But to indigent persons, such professional service should always be cheerfully and freely accorded.

The benefits accruing to the public, directly and indirectly, from the active and constant labors and beneficence of the medical profession are so numerous and important that physicians are justly entitled to the utmost consideration from the community. The public ought, likewise, to entertain a just appreciation of the proper qualification of a practitioner of medicine; to make a due discrimination between true science and the assumption of ignorance and empiricism; to afford every encouragement and facility for the acquisition of medical education, and not to allow the provisions of their statute books or of the prospectus of their chartered institutions to interpose any obstacle to the attainment of the fullest knowledge of every branch of medical science, or, in any way, to restrain the most entire freedom of thought, investigation and action in matters appertaining to the practice of medicine.

APPENDIX.

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TABLE SHOWING NUMBER OF PHYSICIANS FOR EACH 100,000 OF POPULATION BY STATES.

States.	Number of Male Physicians.		Number of Female Physicians.	
	1900.	1910.	1900.	1910.
Alabama	116	113	1	1
Alaska	105	120	12	0
Arizona	180	119	3	3
Arkansas	201	169	3	3
California	260	190	40	31
Colorado	243	204	32	22
Connecticut	155	127	14	10
Delaware	151	123	4	5
District of Columbia	315	349	20	31
Florida	126	120	4	6
Georgia	120	110	2	3
Idaho	126	116	9	9
Illinois	189	162	17	15
Indiana	204	150	8	7
Iowa	166	140	12	11
Kansas	190	142	13	9
Kentucky	165	135	4	4
Louisiana	110	123	2	2
Maine	165	162	9	11
Maryland	170	163	7	7
Massachusetts	169	161	27	20
Michigan	168	143	11	8
Minnesota	109	113	11	8
Mississippi	149	107	1	2
Missouri	221	194	9	10
Montana	141	160	7	13
Nebraska	145	154	12	10
New Hampshire	176	154	15	15
Nevada	195	207	15	15
New Jersey	133	107	9	8
New Mexico	104	139	3	5
New York	177	157	12	15
North Carolina	90	87	1	2
North Dakota	94	98	5	4
Ohio	192	159	10	9
Oklahoma	179	152	7	6
Oregon	183	163	20	2
Pennsylvania	154	154	9	10
Rhode Island	144	127	13	8
South Carolina	89	80	1	2
South Dakota	115	111	6	7
Tennessee	181	167	2	4

States.	Number of Male Physicians.		Number of Female Physicians.	
	1900.	1910.	1900.	1910.
Texas	191	125	3	4
Utah	97	104	12	13
Vermont	211	197	7	9
Virginia	113	180	2	2
Washington	172	144	12	13
West Virginia	141	130	2	3
Wisconsin	161	111	7	6
Wyoming	153	140	13	8

TABLE SHOWING NUMBER OF PHYSICIANS PER 100,000 OF POPULATION IN THE LEADING CITIES.

Cities.	Number of Male Physicians.		Number of Female Physicians.	
	1900.	1914.	1900.	1914.
Atlanta	373	251	22	15
Albany	198	197	6	13
Baltimore	218	194	14	1
Boston	265	249	60	31
Bridgeport, Conn	158	140	13	8
Buffalo	187	170	18	11
Cambridge, Mass	159	143	22	12
Chicago	114	169	32	22
Cincinnati	217	110	24	12
Cleveland	250	144	22	10
Columbus, O	260	154	19	10
Dayton, O	224	195	12	10
Denver	151	114	18	10
Detroit	349	114	13	10
Fall River	83	98	8	5
Grand Rapids	203	174	29	10
Indianapolis	301	256	27	19
Jersey City	100	80	8	4
Kansas City	139	324	49	32
Los Angeles	508	267	89	58
Louisville	264	273	15	18
Lowell	145	136	15	10
Memphis	188	254	8	10
Milwaukee	151	138	13	10

Cities.	Number of Male Physicians.		Number of Female Physicians.	
	1900.	1914.	1900.	1914.
Minneapolis	222	197	54	24
Nashville	320	273	10	18
New Haven	196	159	17	13
New Orleans	123	175	26	5
New York	190	138	14	10
Oakland	330	189	60	38
Omaha	271	257	45	25
Paterson	116	115	7	5
Philadelphia	101	198	19	19
Pittsburg	117	169	20	9
Portland	297	241	63	41
Providence	176	165	19	14
Richmond	210	187	14	9
Rochester, N. Y.	196	166	25	18
St. Louis	233	228	18	16
St. Paul	187	174	17	15
San Francisco	321	210	51	34
Scranton	138	128	13	10
Seattle	291	230	21	30
Spokane	280	200	25	25
Syracuse	242	206	37	20
Toledo	236	208	23	14
Washington	316	300	12	21

STATISTICS OF MEDICAL COLLEGES.

Name and Location of College.	School or System.	Sex Admitted.	Years of Collegiate Work Required.	Number of Years in Course.	Total Tuition Fees.
Med. Col., Birmingham, Ala.	R.	M.	1	2	$208
University of Ala., Mobile, Ala.	R.	M.	2	4	585
University of Ark., Little Rock	R.	M.	...	4	525
Col. of Physicians and Surgeons, San Francisco	R.	M.F.	...	4	670
Hahnemann Med. Col., San Francisco.	H.	M.F.	...	4	455
Leland Stanford Junior Univ. (*a*), San Francisco	R.	M.F.	2	4	620
University of California, San Francisco	R.	M.F.	2	4	660
Col. of Physicians and Surgeons, Los Angeles	R.	M.F.	1	4	654
Col. of Osteopathic Physicians and Surgeons, Los Angeles	O.	M.F.	...	4	600
Col. of Med. and Surgery, Oakland, Cal.	R.	M.	...	4	760
College of Medical Evangelists, Loma Linda, Cal.	R.	M.F.	2	4	459
University of Colorado, Boulder, Denver	R.	M.	2	4	300
Yale Medical School, New Haven, Conn.	R.	M.	2	4	694
George Washington University, Washington, D. C.	R.	M.	...	4	617
Georgetown University, Washington, D. C.	R.	M.F.	2	4	615
Howard University, Washington, D. C.	R.	M.F.	2	4	420
Atlanta Medical College	R.	M.	2	4	600
Southern Col. of Med., Atlanta, Ga.	R.	M.	...	4	300
University of Georgia, Augusta, Ga.	R.	M.F.	2	4	550
Bennett Medical College, Chicago	R.	M.F.	1	4	600
Chicago Col. of Med. and Surg., Chicago	R.	.....	1	4	400
Hahnemann Med. Col. and Hospital, Chicago	H.	M.	2	4	580
Jenner Medical College, Chicago	R.	M.F.	...	4	525
Northwestern University Med. School, Chicago	R.	M.F.	2	4	776
Rush Medical College (*a*), Chicago	R.	M.	2	4	725
College of Osteopathy, Chicago	O.	M.F.	...	4	600
University of Illinois, Chicago	R.	M.F.	2	4	620

Name and Location of College.	School or System.	Sex Admitted.	Years of Collegiate Work Required.	Number of Years in Course.	Total Tuition Fees.
Indiana University, Indianapolis-Bloomington, Ind	R.	M.F.	2	4	460
State University of Iowa, Iowa City, Ia.	R.	M.F.	2	4	200
Still Col. of Osteopathy, Des Moines, Ia	O.	M.F.	...	3	450
University of Kansas, Kansas City	R.	M.	2	4	300
University of Louisville, Louisville, Ky.	R.	M.F.	1	4	610
Tulane University School of Med., New Orleans, La	R.	M.F.	2	4	750
Medical School of Maine, Portland, Me.	R.	M.F.	1	4	450
Col. of Physicians and Surgeons, Baltimore, Md	R.	M.F.	2	4	525
John Hopkins University, Baltimore, Md	R.	M.F.	2	4	800
University of Maryland, Baltimore, Md	R.	M.F.	1	4	710
Boston University, Boston, Mass	H.	M.F.	2	4	535
Mass. Col. of Osteopathy, Cambridge, Mass	O.	M.F.	...	4	600
College of Physicians and Surg., Boston, Mass	R.	M.	...	4	410
Harvard Medical School, Boston, Mass.	R.	M.	2	4	445
Tufts College Medical School, Boston, Mass	R.	M.F.	1	4	620
Detroit College of Medicine, Detroit, Mich	R.	M.F.	1	4	465
University of Michigan, Ann Arbor, Mich	H.	M.F.	2	4	359
University of Minnesota (*a*), Minneapolis, Minn	R.	M.F.	2	4	600
University of Mississippi, Oxford, Miss.	R.	M.	2	2	207
University of Missouri, Columbia, Mo.	R.	M.F.	...	2	120
Kansas City Hahnemann Med. Col., Kansas City, Mo	H.	M.F.	1	4	.....
Eclectic Medical University, Kansas City, Mo	E.	M.	...	4	400
American Medical College, St. Louis, Mo	R.	M.F.	1	4	550
American School of Osteopathy, Kirksville, Mo	O.	M.F.	...	4	600

Name and Location of College.	School or System.	Sex Admitted.	Years of Collegiate Work Required.	Number of Years in Course.	Total Tuition Fees.
Central Col. of Osteopathy, Kansas City, Mo.	O.	M.F.	...	4	600
St. Louis Col. of Phys. and Surg., St. Louis, Mo.	R.	M.F.	...	4	420
Washington University, St. Louis, Mo.	R.	M.	2	4	610
John A. Creighton Med. Col., Omaha, Nebr.	R.	M.F.	1	4	530
University of Nebraska, Omaha, Nebr.	R.	M.F.	2	4	416
Cotner Medical College, Omaha, Nebr.	E.	M.F.	...	4	400
Dartmouth Medical College, Hanover, N. H.	R.	M.	2	4	482
Albany Medical College, Albany, N. Y.	R.	M.F.	1	4	525
Columbia University, New York City.	R.	M.F.	2	4	1035
Cornell University Medical Col., New York City	R.	M.F.	2	4	760
~~Fordham University, New York City~~	~~R.~~	~~M.~~	~~1~~	~~4~~	~~800~~
Long Island College Hospital, Brooklyn, N. Y.	R.	M.F.	2	4	820
New York Homeopathic Med. Col. and Hosp., New York City	H.	M.	...	4	655
New York Medical Col. and Hosp. for Women, New York City	H.	F.	...	4	595
University and Bellevue Hosp. Med. Col., New York City	R.	M.	2	4	830
Syracuse University, Syracuse, N. Y.	R.	M.	2	4	679
University of Buffalo, Buffalo, N. Y.	R.	M.F.	1	4	645
Leonard Medical School, Raleigh, N. C.	R.	M.	2	4	228
University of No. Carolina, Chapel Hill, N. C.	R.	M.	2	2	231
North Carolina Med. Col., Charlotte, N. C.	R.	M.F.	...	4	439
School of Medicine, Wake Forest, N. C.	R.	M.	2	2	205
University of No. Dakota, University, No. Dak.	R.	M.F.	2	2	100
Cleveland-Pulte Med. Col., Cleveland, Ohio	H.	M.F.	...	4	500
Western Reserve Univ., Cleveland, Ohio	H.	M.	2	4	627
Eclectic Med. Col., Cincinnati, Ohio.	R.	M.F.	...	4	400

Name and Location of College.	School or System.	Sex Admitted.	Years of Collegiate Work Required.	Number of Years in Course.	Total Tuition Fees.
Ohio-Miami Med. Col., Cincinnati, Ohio	R.	M.F.	2	4	600
Starling-Medical Col., Columbus, Ohio	R.	M.F.	...	4	600
Toledo Medical Col., Toledo, Ohio	R.	M.	...	4	519
University of Oklahoma, Norman and Oklahoma, Okla	R.	M.F.	2	4	288
University of Oregon, Portland, Ore.	R.	M.F.	1	4	605
Hahnemann Med. Col. and Hospital, Philadelphia, Pa	H.	M.	2	4	720
Jefferson Med. Col., Philadelphia, Pa.	R.	M.	1	4	720
College of Osteopathy, Philadelphia, Pa	O.	M.F.	...	4	600
Temple University, Philadelphia, Pa.	R.	M.F.	1	4	600
University of Pennsylvania, Philadelphia, Pa	R.	M.	2	4	662
Women's Med. Col. of Pennsylvania, Philadelphia, Pa	R.	F.	2	4	727
University of Pittsburgh, Pittsburgh, Pa	R.	M.	2	4	900
Medical College of So. Carolina, Charleston, S. C	R.	M.	2	4	375
University of So. Dakota, Vermillon, S. Dak	R.	M.	2	2	120
Lincoln Memorial University, Knoxville, Tenn	R.	M.F.	...	4	445
Meharry Medical College, Nashville, Tenn	R.	M.F.	...	4	255
Vanderbilt University, Nashville, Tenn.	R.	M.	1	4	625
University of Tennessee, Memphis, Tenn	R.	M.F.	1	4	525
University of West Tennessee, Memphis, Tenn	R.	M.	1	4	230
Fort Worth School of Medicine, Fort Worth, Tex	R.	M.	...	4	460
University of Texas, Galveston, Tex.	R.	M.F.	2	4	119
Baylor University, Dallas, Tex	R.	M.F.	1	4	473
Southern Methodist University, Dallas, Tex	R.	M.F.	1	4	430
University of Utah, Salt Lake City, Utah	R.	M.F.	2	2	110

Name and Location of College.	School or System.	Sex Admitted.	Years of Collegiate Work Required.	Number of Years in Course.	Total Tuition Fees.
University of Vermont (*a*), Burlington, Vt.	R.	M.	1	4	585
Medical College of Virginia, Richmond, Va.	R.	M.	2	4	686
University of Virginia, Charlottesville, Va.	R.	M.	2	4	560
West Virginia University, Morgantown, W. Va.	R.	M.	2	2	100
Marquette University, Milwaukee, Wis.	R.	M.F.	2	4	635
University of Wisconsin, Madison, Wis.	R.	M.F.	2	4	308
University of the Philippine, Col. of Med. and Surg., Manila, P. I.	R.	M.F.	...	4	.....

Note, (*a*) require hospital interneship before granting degree. Schools not listed as to requirement of collegiate work for admission accept certificate of approved high schools.

A number of schools give a two years' pre-medical course, but complete data is not available.

SCHOLARSHIPS IN MEDICAL COLLEGES.

This list was compiled by the Journal of the American Medical Association for 1916.

University of Alabama School of Medicine	66
Leland Stanford Junior University School of Medicine	3
University of California Medical School	3
University of Colorado School of Medicine*	1
Yale University School of Medicine	2
Georgetown University School of Medicine	3
Atlanta Medical College	12
Hahnemann Medical College and Hospital of Chicago*	6
Northwestern University Medical School	9
Rush Medical College, Chicago	6
University of Illinois College of Medicine*	6
Indiana University School of Medicine	10

Bowdoin Medical School	1
Johns Hopkins University Medical Department	6
University of Maryland School of Medicine	6
Boston University School of Medicine*	20
Medical School of Harvard University, Boston*	27
Detroit College of Medicine and Surgery	6
University of Minnesota Medical School*	1
University of Missouri School of Medicine	1
Washington University Medical School	1
Dartmouth Medical School	2
Columbia University College of Physicians and Surgeons	64
New York Medical College and Hospital for Women	2
Syracuse University College of Medicine	1
University and Bellevue Hospital Medical College	1
University of Buffalo Department of Medicine	1
University of North Carolina School of Medicine	1
University of Cincinnati College of Medicine	12
Western Reserve University School of Medicine	1
University of Oregon Department of Medicine	3
Hahnemann Medical College and Hospital of Philadelphia	3
Jefferson Medical College	1
University of Pennsylvania School of Medicine*†	3
University of Pittsburgh School of Medicine	2
Woman's Medical College of Pennsylvania	8
Medical College of the State of South Carolina	8
University of Tennessee College of Medicine	1
Vanderbilt University Medical Department	4
University of Texas Department of Medicine*	1
University of Vermont College of Medicine	9
Medical College of Virginia	10
University of Virginia Department of Medicine	2

* Have loan funds also.

† Has fifty or more scholarships for graduates of Philadelphia high schools.

TABULAR SUMMARY OF MEDICAL LAWS

States and Territories	Single Board of Examiners, Number	Separate Board for "Regulars" Number	Separate Board for Homeopaths, Number	Separate Board for Eclectics, Number	Separate Board for Osteopaths, Number	Length of Term	Appointed by Governor; by Governor on Nomination by Medical Societies	Examination Fees	Fee for Validating Licenses Issued by Other States	Usual Dates of Examination	Percentage of all Applicants who Failed on Examination for 1916
Alabama	10							10		Semi-annually	39
Alaska	8					2	Gov.	25	25	Jan., July	8
Arizona	5	(2)	(1)	(1)	(1)	2	Gov.	25		Jan., Apr., July, Oct.	21
Arkansas		7	7	7		2	Gov.	15	25		14
California	10					4	Gov.	25	50	3 annually	5
Colorado	9					6	Gov.	25	25	Jan., Apr., July, Oct.	24
Connecticut		4	4	4				25	15		32
Delaware		5	5			2	Gov.	10	50	July	13
District Columbia	5							10	10	Jan., Apr., July, Oct.	29
Florida		7	3	2		4	Gov.	15		Semi-annually	21
Georgia	10	(5)	(2)	(3)		4	Gov.	20	50	May, Oct.	5
Idaho	6					6	Gov.	25		Apr., Oct.	0
Illinois	7							10	10		15
Indiana	6					4	Gov.	25	50	Jan., July	7
Iowa	6						Gov.	10	50	Jan., July	2
Kansas	7					4	Gov.	15	15	Feb., June, Oct.	3
Kentucky	7						Gov.	10	10	Semi-annually	13
Louisiana		5	5			6		25	50	Semi-annually	13
Maine	6					6	Gov.	15	15	Mar., July, Nov.	7
Maryland		8	8			4		15	25		23
Massachusetts	7					7	Gov.	20		July	19
Michigan	10	(5)	(2)	(2)		4	Gov.	25	50	Oct., June	3
Minnesota	9		(3)			3	Gov.	10	50	Jan., Apr., July, Oct.	2
Mississippi	15						Gov.	10	50	Semi-annually	38
Missouri	7						Gov.	15	25		7
Montana	7						Gov.	25		Apr., Oct.	27
Nebraska	5						Gov.	25	25	Feb., Aug., Nov.	0
Nevada	5					4	Gov.	25	25	May, Nov.	9
New Hampshire		5	5	5			Gov.	20	20		0
New Jersey	9	(5)	(3)			3	Gov.	25	50	June, Oct.	12
New Mexico	7					4	Gov.	25	25	Jan., Apr., July, Oct.	16
New York	9					3	Rege.	25	25		23
North Carolina	10							15	50		16
North Dakota	9					3	Gov.	25	25	Jan., July	25
Ohio	8					7	Gov.	25	50	Jan., Apr., July, Oct.	3
Oklahoma	9						Gov.	15	25		13
Oregon	6							10			31
Pennsylvania	7					3		25	50	Semi-annually	12
Rhode Island	8								20	Jan., Apr., July, Oct.	20
South Carolina	8						Gov.	10	10	June	40
South Dakota	5						Gov.		20	Quarterly	20
Tennessee	6						Gov.	10	10		13

States and Territories	Single Board of Examiners, Number	Separate Board for "Regulars" Number	Separate Board for Homeopaths, Number	Separate Board for Eclectics, Number	Separate Board for Osteopaths, Number	Length of Term	Appointed by Governor; by Governor on Nomination by Medical Societies	Examination Fees	Fee for Validating Licenses Issued by Other States	Usual Dates of Examination	Percentage of all Applicants who Failed on Examination for 1916
Texas	10						Gov.	25	50	Semi-annually	12
Utah	9					6	Gov.	25	75		0
Vermont	7	(3)	(2)	(2)		6	Gov.	20	50	Jan., July	0
Virginia	17					4	Gov.	25	50		7
Washington	9	(5)	(2)		(2)		Gov.	25			7
West Virginia	12						Gov.	10	25		3
Wisconsin	8	(3)	(2)	(2)	(1)	4	Gov.	25	50		5
Wyoming	3	(3)						25	25		25

Full data is not available from some states in which the licensing power is vested in boards of health.

A LIST OF INDIAN SERVICE STATIONS.

ARIZONA: Camp Verde, Fort Defiance, Keams, Canon, Leupp, Mohave City, Parker, Phoenix, Sacaton, San Carlos, Supai, Cootsdale, Talklai, Tuba, Valentine, Yuma.

CALIFORNIA: Altmas, Banning, Campo, Covelo, Greenville, Hoopa, Pala Riverside, San Jacinto, Ysabel.

COLORADO: Ignacia, Navajo, Springs.

IDAHO: Lapwai, Rossfork.

IOWA: Toledo.

KANSAS: Horton, Lawrence.

MICHIGAN: Mt. Pleasant.

MINNESOTA: Cloquet, Grand Portage, Nett Lake, Onigum, Pipestone, Red Lake, Tower, White Earth, Browning, Crow Agency, Harlem, Jacko, Lame-Deer, Poplar.

NEBRASKA: Genoa, Winnebago.

NEVADA: Fallon, Lovelocks, McDermitt, Moapa, Schurz, Stewart, Wadsworth.

NEW MEXICO: Albuquerque, Blackrock, Crownpoint, Dulce, Mescalero, Santa Fe, Shiprock.

NEW YORK: Salamanca.

NORTH CAROLINA: Cherokee.

NORTH DAKOTA: Belcourt, Bismarck, Elbowoods, Fort Totten, Fort Yates, Wahpeton.

OKLAHOMA: Auadarko, Chilocco, Colony, Contomnent, Geary, Hammon, Otoe, Pawhusha, Pawnee, Shawnee, Stroud, White Eagle, Wyandotte.

OREGON: Chemawa, Klamath Agency, Pendleton, Siletz, Warm Springs.

PENNSYLVANIA: Carlisle.

SOUTH DAKOTA: Canton, Cheyenne Agency, Crow Creek, Flaudreau, Greenwood, Pierre, Pine Ridge, Rapid City, Rosebud, Sisseton.

UTAH: Santa Clara, Whiterocks.

WASHINGTON: Lincoln, Miles P. O., Neah Bay, Simcoe, Tacoma, Tekva, Tulalip.

WISCONSIN: Ashland, Bayfield, Carter, Lac du Flambeau, Neopit, Tomah, Wittenberg.

WYOMING: Wind River.

A LIST OF SANITARIUMS OPERATED PRIVATELY, HAVING A CAPACITY OF 50 OR MORE PATIENTS.

Hospitals and sanatoriums employ all kinds of help; laborers, stenographers and care takers, male nurses and druggists. Positions are not difficult to secure and the pay is usually better than for similar positions outside. Ambitious persons who are desirous to prepare later for medicine may secure valuable experience while they are earning money to pay for their medical education. Positions in public hospital are usually obtained through civil service examinations. Appointments to the miscellaneous service in private institutions are obtained by application to these institutions. A list of such institutions is given herewith.

Castle Hot Springs Hotel and Resort, Hot Springs, Ariz.
Desert Inn, Phoenix, Ariz.
Tucson-Arizona Sanatorium, Tucson, Ariz.
Armstrong Springs Sanatorium, Armstrong, Ark.
Eureka Sanatorium, Eureka Springs, Ark.
Dale Sanatorium, Texarkana, Ark.
Arrowhead Hot Springs Health Resort, Arrowhead Springs, Cal.
Gardner Sanatorium, Belmont, Cal.
California Sanatorium, Belmont, Cal.
Burke Sanatorium, Burke, Cal.
Idyllwild Sanatorium, Idyllwild, Cal.
San Carlos Sanatorium, La Manda Park, Cal.
Livermore Sanatorium, Livermore, Cal.
Loma Linda Sanatorium, Loma Linda, Cal.
Long Beach Sanatorium, Long Beach, Cal.
Pottenger Sanatorium, Monrovia, Cal.
Paradise Valley Sanatorium, National City, Cal.
Acropolis Sanatorium, Oakland, Cal.
Nauheim Sanatorium, Oakland, Cal.
Las Eucinas, Lamanda Park, Pasadena, Cal.

Southern California Sanatorium, Lamanda Park, Pasadena, Cal.
Agnew Sanatorium, San Diego, Cal.
Adler Sanatorium, San Francisco, Cal.
O'Conner Sanatorium, San Jose, Cal.
St. Helena Sanatorium, Sanatorium, Cal.
El Reposo Sanatorium, Sierra Madre, Cal.
Pasadena Sanatorium, South Pasadena, Cal.
Clarks Sanatorium, Stockton, Cal.
Boulder, Colorado Sanatorium, Boulder, Col.
Glockner Sanatorium, Colorado Springs, Col.
Star Ranch In-the-Pines Sanatorium, Col.
Agnes Memorial Sanatorium, Denver, Col.
Jewish Consumptive Relief Soc. Sanatorium, Edgewater, Col.
Glenwood Sanatorium, Glenwood, Col.
Idaho Springs Sanatorium, Idaho Springs, Col.
Dr. Friend's Sanatorium, Lamar, Col.
Montcalm Sanatorium, Manitou, Col.
Modern Woodmen Sanatorium, Woodmen, Col.
Dr. McFarland's Sanatorium, Greens Farm, Conn.
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